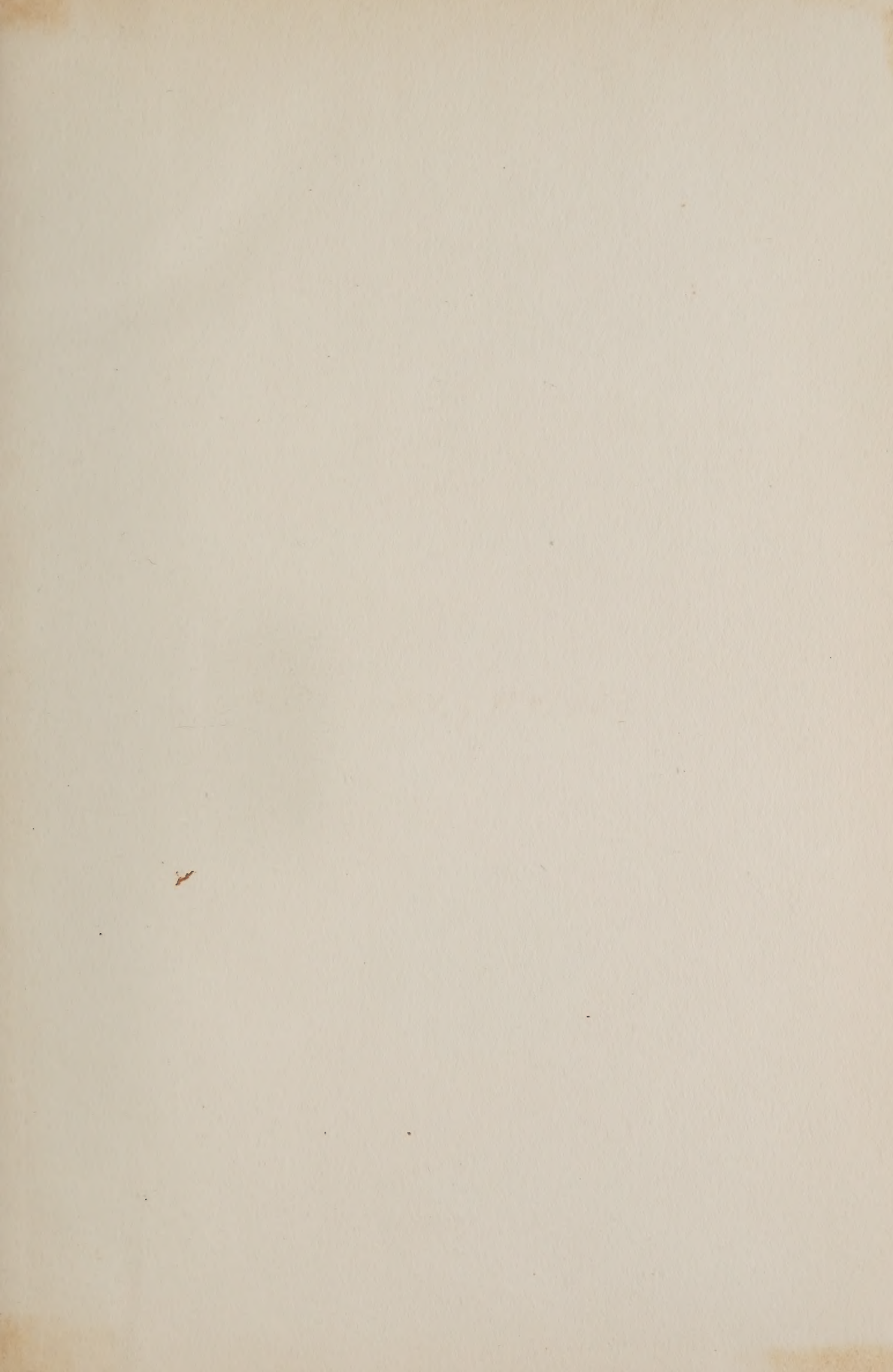


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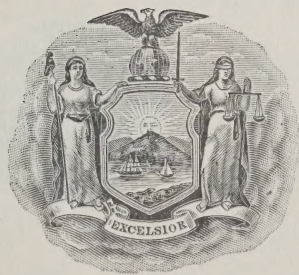


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OF THE
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ONE HUNDRED AND THIRTY-FOURTH SESSION


1911.

VOL. IX.—No. 20.



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1911

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STATE OF NEW YORK

FOREST, FISH AND GAME
COMMISSION

SIXTEENTH ANNUAL REPORT

TRANSMITTED TO THE LEGISLATURE JANUARY 12, 1911



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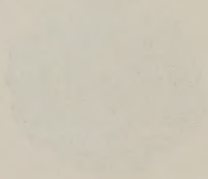
STATE OF NEW YORK

FOREST, FISH AND GAME
COMMISSION

SIXTEENTH ANNUAL REPORT

PRESENTED TO THE SENATE AND ASSEMBLY

ALBANY
JANUARY 1905



PRINTED BY THE STATE PRINTING OFFICE
ALBANY, N. Y.

SIXTEENTH ANNUAL REPORT
OF THE
Forest, Fish and Game Commission

ALBANY, N. Y., *January 12, 1911.*

Hon. DANIEL D. FRISBIE, *Speaker of the Assembly:*

SIR.—I have the honor to transmit herewith, as provided by law, the Sixteenth Annual Report of the Forest, Fish and Game Commission.

Respectfully,

H. LEROY AUSTIN,

Commissioner.

STATE OF NEW YORK

Forest, Fish and Game Commission

H. LEROY AUSTIN, Catskill.....*Commissioner*
JOHN B. BURNHAM, Essex.....*Deputy Commissioner*
JOHN D. WHISH, Albany.....*Secretary*

Superintendent of Forests....CLIFFORD R. PETTIS, Lake Clear Jct.
Chief Game Protector.....LLEWELLYN LEGGE, Binghamton
State Fish Culturist.....Dr. TARLETON H. BEAN, New York
Acting Superintendent Marine Fisheries

CLINTON S. DIXON, New York

ANNUAL REPORT
OF THE
Forest, Fish and Game Commission

ALBANY, N. Y., January 4, 1911.

To the Honorable, the Legislature:

Herewith is submitted the Sixteenth Annual Report of the Forest, Fish and Game Commission, with such few recommendations as have suggested themselves during the brief incumbency of the present Commissioner.

As a part of this document are submitted the reports of the chiefs of the various divisions of the Forest, Fish and Game Commission, wherein will be found detailed statements of the work accomplished by each during the past year.

For the fiscal year ending September 30, 1910, the receipts of the department from all sources aggregated \$248,878.08, as compared with receipts of \$230,675.22 for the preceding fiscal year; the disbursements for all purposes amounted to the sum of \$487,753.54, as compared with disbursements of \$722,947.93 for the fiscal year ending September 30, 1909, the difference being largely due to decreased payments for the purchase of lands within the forest preserve and for fire rebates. A detailed statement of the departmental receipts and expenditures will form a part of this report.

Particular attention is directed to the report of the department of fish culture. During the past year 537,295,600 fish of various kinds have been distributed from the hatching stations of the State. The fish supply of the future must largely depend upon artificial propagation by the State and the public moneys expended for this purpose, if properly used, will be returned a hundred-fold.

The results attained by different hatcheries vary in too great a degree. The Cold Spring Harbor hatchery accomplishes results which should be more nearly approached by the other stations, and it is believed that this can easily be done by the intelligent expenditure of a comparatively small sum. A plentiful supply of pure water will accomplish wonders in many of our hatching stations, and without it better results cannot be expected. The recommendations of the State Fish Culturist for the improvement of the hatchery service are heartily indorsed by me.

During the past few months the protective force has been largely reorganized and I believe its efficiency has been greatly increased. I earnestly recommend an increased appropriation for the traveling expenses of the protectors; each is now entitled to a maximum of \$41.66 per month for this purpose and it needs no argument to convince that a man cannot travel away from home 26 days each month, paying railroad fares, board, livery, etc., upon an allowance of \$1.60 per day. A protector should not be expected to disburse for traveling expenses any part of his meagre salary of \$900 per year, and in order to keep within his expense allowance he must arrange his patrol so as to spend the greater part of his nights at home, which necessarily limits his field of operations and greatly impairs the efficiency of his work. If this department is expected to patrol and protect the entire State with a force of but 90 protectors, it should certainly be allowed a sufficient appropriation for the expenses of its protective force. Personally I believe the number of protectors is entirely inadequate. Practically every section of the State demands increased protection, which it is impossible to give with the present force.

The work of the protective department of this commission must be preventive and educational, as well as punitive, before it can reach the highest standard of efficiency. It is feared that too much attention has been paid to punishment for violations already committed rather than to the prevention of those violations. Our citizens must be taught the necessity for the observance of sane laws for the protection of fish and game, and that therein lies our only hope for the maintenance of this important source of food

supply. Every person who becomes thoroughly convinced of the wisdom of these laws becomes in himself a protective force and a working arm of the Forest, Fish and Game Commission.

It has been urged that better results would be accomplished by a separation or division of the present Forest, Fish and Game Commission into two or three separate departments. The advisability of such a course must be determined in the first instance by the Legislature and suggestions from the present head of the department might be of questionable propriety.

I simply desire to point out that the creation of two or three departments from the present Forest, Fish and Game Commission must inevitably involve much additional expense unless there be combined with one or more of these new departments the duties and powers of some other department or commission having powers and duties not embraced within those of the forest, fish and game commission as now constituted. At the present time, the duties of the forestry force and the fish and game protective force are, to a certain extent, interchangeable. The fish and game protectors protect the forests of the State in the forest preserve counties and the fire patrolmen assist in the protection of fish and game. If these employees are confined to one class of duties, the number required to properly perform the work must necessarily be greatly increased, which means added expense. If the commission is divided, each of the new departments will require a separate office staff and I think I am safe in saying that such a division cannot fail to increase expenditures unless, as before stated, some other branch of the State government can be combined with one or more of the new departments created from the present Forest, Fish and Game Commission. As to whether this would result in increased efficiency in my opinion depends entirely upon the personal equation. If, however, the forests, the fish and the game are to be continued under the supervision of a single commissioner, I favor a reorganization of the machinery of the department, by provision for three deputies instead of one as at present. The Commissioner should be the administrative head of the department, with a trained deputy in actual charge of each of three

great divisions of the department. A bureau of inland fisheries should be established, charged with the supervision of fresh water food fisheries, of non game variety. In many quarters of the State, where it is not now permitted, suckers, carp, eels, white fish, etc., could be taken in such quantity as to constitute an important source of food supply. Under proper supervision these food fish might be taken without endangering the supply of game fish, and at the same time the State might easily realize a revenue of \$25,000 or more per year from the sale of net licenses. In this respect, the recommendations of former Chief Protector Burnham, submitted herewith, merit careful consideration.

The State can no longer evade the questions involving the occupancy of its forest lands in the forest preserve counties. In violation of the plain provisions of the Constitution and statutes of this State a large number (several hundred) of persons reside in buildings erected upon State forest preserve land, during all or a portion of the year; rich and poor alike are included within the category of squatters. The eviction of many of these persons would work great hardship and the well-to-do cottager protests with great energy against any movement to oust him from what he conceives to be almost a vested right.

The arguments in favor of the leasing by the State of camp sites on its forest lands need not be repeated by me: these arguments have been iterated and reiterated until they should be familiar to every person interested in preserving our beautiful lakes and forests for the public welfare. What harm can result from the leasing of camp sites is difficult to ascertain, while the benefits which would accrue are self apparent, to say nothing whatever of the great revenue which the State might receive by adopting such a course.

But whatever be the future policy of the State its present position is little short of ridiculous. We prevent, or pretend to prevent, the erection of any new buildings upon the State forest lands but, without receiving any return whatever for the use of our property, we allow the man who is now located thereon to continue his occupancy in plain violation of the Constitution and stat-

utes. This condition of affairs is most unjust; if John Doe occupies, free of ground rent, a beautiful summer home upon the shores of one of the Adirondack lakes owned by the State of New York, there is no reason why Richard Roe should not receive the same privilege. Either John Doe should be required to move off or Richard Roe should be permitted to move on if he so desires.

The Forest, Fish and Game Commissioner is the official charged with the responsibility of evicting these squatters, but the interests involved are so great that he should not be required to act without legislative direction. The Legislature should, in my opinion, take immediate steps to amend the Constitution so as to permit the leasing of camp sites on the forest preserve lands or else it should, by resolution, direct the Forest, Fish and Game Commissioner to evict all squatters without delay, regardless of the consequences.

The members of the present Land Purchasing Board are a unit in the belief that if the State is to continue the purchase of lands in the forest preserve counties a different policy should be adopted than that which has heretofore been in vogue. Except recently (and in the Catskill region alone) the State has made no effort to seek out desirable purchases and to consummate the same, but has depended entirely upon voluntary offers and as a result has, in most instances, purchased only such land as could not be sold to any one else. Furthermore, the sale of forest land to the State has been hedged around with so much red tape and has consumed so much time as to absolutely discourage vendors from offering their lands.

The present board believes that the vendor should not be required to furnish a certified county clerk's abstract but that the State should bear the expense of searching the titles of land, the purchase of which is considered. Many persons absolutely decline to offer their land to the State for the reason that they are required to expend a considerable sum of money for title papers with no assurance that the title will prove satisfactory to the State officials, and thus many advantageous opportunities for purchase are lost.

Under the present system the delays in consummating many transactions have been most exasperating and it is little wonder that many owners of forest lands within the Adirondack and Catskill parks absolutely decline to deal with the State. If it intends to purchase lands at all the State should employ at least one agent in the Catskills and one in the Adirondacks, empowered to initiate negotiations for the purchase of desirable lands and should bear the entire expense of examining the titles thereof. By so doing it is believed that better lands may be purchased and at a less price.

Considerable difficulty has been met in attempts to enforce the so-called "Top Lopping Law," as contained in section 56 of the Forest, Fish and Game Law. The statute provides that the limbs or branches of coniferous trees cut within the forest preserve counties shall be cut off or lopped "at the time of cutting the said trees"; it would appear that all practical purposes would be accomplished by requiring the lopping of tops and branches to be performed within say sixty days after the cutting of the trees, as the tops and branches do not materially increase the fire risk while green. It is also recommended that the operation of this top lopping law be confined to the fire towns enumerated in section 73 of the Forest, Fish and Game Law, rather than to all of the forest preserve counties.

I cannot too strongly urge continued and increased appropriations for purposes of reforestation. The public ear is keenly attuned to the necessity for preserving our natural resources and for remedying, in so far as practicable, the conditions which have resulted from greed and short-sightedness. The work of this department in reforesting denuded lands has been highly successful and it must be continued upon a larger scale. The investment will prove most profitable in years to come, when the condition of our public forests and an enlightened public policy shall permit the cutting and sale of the ripe timber upon the public domain.

The game laws should, to some extent, be amended at this session of the Legislature, but I strongly urge that, in so far as may

be possible, these amendments may be general and not special. The report of former Chief Protector Burnham, annexed hereto, deals with certain needed changes in the law and his recommendations are heartily indorsed by me.

Respectfully submitted,

H. LEROY AUSTIN,
Forest, Fish and Game Commissioner

DEPARTMENT OF FORESTRY

CLIFFORD R. PETTIS,
Superintendent State Forests

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Observer on Mount Morris, Franklin County. Note view of surrounding country.
Photo by Dr. E. W. Keffer, Philadelphia, Pa.

REPORT OF THE SUPERINTENDENT OF FORESTS

INTRODUCTION

Hon. H. LEROY AUSTIN, *Forest, Fish and Game Commissioner*:

SIR.—The work of this department has decidedly increased in the past year. The demand from private land owners for information in regard to forestry problems has grown so rapidly that it is now continuous. The efficiency of the fire patrol has increased and a large force has been maintained. The constantly rising price of stumpage has been an incentive to trespass but a determined effort has been made to protect State property. The extent and output of the nurseries for the propagation of forest trees for planting has produced additional work. A systematic attempt has been made to secure information in regard to our forests and their conditions, as well as the compilation of useful data which will be necessary in this connection.

During the year several changes in the personnel have taken place. Professor Austin Cary resigned as Superintendent of State Forests and the writer was promoted to this position, assuming his duties June first. Mr. F. Frank Moon who has been, under the direction of this Commission, Forester to the Highlands of the Hudson Reservation, resigned to accept the position of assistant professor of forestry in the Massachusetts Agricultural College. Mr. George L. Barrus, a graduate of the Forest School of the University of Michigan, and Mr. Frederick A. Gaylord, a graduate of the Yale Forest School, have been appointed foresters.

FOREST FIRES

GENERAL STATEMENT

The season of 1910 was not, in this State, one of prolonged drought. However, at times the situation was critical and many

fires occurred, but in the Adirondacks and Catskills there were only five fires of consequence and two of these destroyed but little forest. A fire in the town of Piercefield, starting May 17th, burned over 1,070 acres and originated from the New York Central railroad. This fire occurred before all of the locomotives on this line had been equipped with oil burning fire boxes and was one of the largest fires of the season. The situation became rather grave early in July, a dense cloud of smoke hung over the entire Adirondacks and the woods were very dry, but at this time only two of the many fires which occurred were not promptly put out by the patrolmen. One fire was on Moose creek, a branch of Cold river in Hamilton county, and the only reason why this fire was not more quickly subdued, was because of its remote location. The fire originated from a camp fire left by fishermen and a determined effort is being made to apprehend the careless party. This fire was most threatening, burning in an old fire slash at a very dry time and when a heavy wind was blowing. It was subdued with but little damage.

At nearly the same time as the Cold river fire, another one started near the Independence river in Lewis county and burned over about 1,300 acres of brush and burned land. This fire is believed to have originated from a camp fire where someone had made coffee. There were many other small fires at this time, but they were promptly extinguished.

Another Adirondack fire burned on Boot Bay Mountain near Lower Saranac Lake. It was doubtless caused by lightning and burned on the higher part of the mountain among the rocks and on steep ledges. It was impossible to control at once on account of its distance from points where labor could be secured, the difficulty experienced by the men in climbing the ledges to the fire, the entire absence of water and its exposure to the unusually strong south wind. It was also impossible to extinguish and burned in the deep "duff" for several weeks. The presence of the smoke on the mountain caused many people to believe that the fire was still spreading, but such was not the case. Fires of this nature are impossible to extinguish without a very large sup-



Fire in the Vicinity of Cold River, Hamilton County, July, 1910.



Photo by R. E. Gooding.

Lumber Slash Adjacent to the Railroad of the Brooklyn Cooperage Company,
Franklin County.

ply of water and in this case our men worked at the greatest disadvantage.

The danger from fire increased in some sections and decreased in others from time to time throughout the summer, depending upon the rainfall which, as a rule, was generally local. The drought later in the season was greater in the southern part of the State than in the northern and during the last ten days of October the situation in the Catskills, on account of the drought and the hunting season, caused much anxiety, but was kept in excellent control, only one large fire occurring at that time.

When we think of the large territory each man had to cover, that there were nearly three hundred fires and that only five of them burned over any considerable area, it indicates a very creditable efficiency in the force.

The fire patrol force, consisting of the four superintendents of fires (three in the Adirondacks and one in the Catskills), assisted by thirty-seven paid fire patrolmen, observers on twenty mountain stations and other patrolmen and supervisors, who were on call in case of a fire, rendered very efficient service.

A summary report of the losses caused and expense incurred in connection with forest fires is submitted herewith:

SUMMARY OF LOSSES BY COUNTIES
ADIRONDACK REGION

COUNTIES	Acreage	Total expense	ACRES PRIVATE LAND BURNED			ACRES STATE LAND BURNED			Value of standing timber destroyed	Value of logs, lumber, etc., destroyed	Value of buildings destroyed
			Timber	Brush	Waste	Timber	Brush	Waste			
Clinton.....	210½	\$253 55	67	91	42½	10	.....	.....	\$379 00	\$2 00	.....
Essex.....	440½	1,286 17	48	92½	22½	10½	.....	.....	447 00	4 00	.....
Franklin.....	836½	1,511 91	143½	130½	230½	144½	212½	.....	380 00	75 00	.....
Fulton.....	50	172 10	3½	32½	5	46	92	65	80 00	5 00	.....
Hamilton.....	245	143 23	83½	10	.....	35	1½	195	23 00	.....	.....
Herkimer.....	131	86 42	85	20	.....	20	.....	.....	263 00	.....	.....
Lewis.....	1,929½	591 88	101	1,419	389½	.....	20	.....	170 00	30 00	.....
Oneida.....	175	11 41	.....	100	79½	.....	.....	.....	.....	.....	.....
St. Lawrence.....	3,130	130 40	1,09½	157½	1,58½	.....	1	22	5,175 00	1,587 00	\$159 00
Saratoga.....	13½	31 97	4½	102½	45½	200	.....	.....	10 00	.....	.....
Warren.....	812½	305 00	404½	24	.....	.....	.....	.....	949 00	3 00	50 00
Washington.....	66½	51 15	22½	.....	.....	.....	.....	.....	43 00	.....	.....
Totals.....	8,058	\$4,535 25	2,641½	2,206½	2,100½	430	397½	282	\$7,912 00	\$1,706 00	\$200 00
CATSKILL REGION											
Delaware.....	884	\$258 28	233	650	.....	1	.....	.....	\$1,600 00	\$40 00	.....
Greene.....	16½	46 00	6	.....	.....	10	.....	.....	1 50	.....	.....
Sullivan.....	2,143	300 55	776	1,042	325	.....	.....	.....	4,617 00	50 00	.....
Ulster.....	1,577½	848 10	408½	1,99½	459½	450	.....	.....	1,052 00	625 00	.....
Totals.....	4,621½	\$1,452 93	1,483½	1,892½	784½	461	.....	.....	\$7,270 50	\$715 00	.....
SUMMARY											
Adirondacks.....	8,058	\$4,535 25	2,641½	2,206½	2,100½	430	397½	282	\$7,912 00	\$1,706 00	\$200 00
Catskills.....	4,621½	1,452 93	1,483½	1,892½	784½	461	.....	.....	7,270 50	715 00	.....
Totals.....	12,679½	\$5,988 18	4,125	4,099	2,885½	891	397½	282	\$15,182 50	\$2,421 00	\$200 00

Total expense does not include regular and special patrol services at fires.



View North from Belle Ayre Mountain Station Showing Village of Pine Hill, N. Y.

LOSSES SUMMARIZED BY CAUSES

ADIRONDACK REGION

CAUSES	Num- ber from each	Acreage	Total expense	ACRES PRIVATE LAND BURNED			ACRES STATE LAND BURNED			Value of logs, lum- ber, etc., destroyed	Value of standing timber destroyed	Value of build- ings de- stroyed
				Timber	Brush	Waste	Timber	Brush	Waste			
Carelessness.....	4	324	\$45 25	.....	7	25½	.....	.....	.....	.....	.....	.....
Fishermen.....	23	634½	1,313 92	115	24½	130½	10	131½	.....	\$10 00	.....	.....
Berry pickers.....	3	24	40 50	5	15½	4	.....	.....	.....	50 00	.....	\$50 00
Smokers.....	31	840	459 16	721	193	274	25½	210	72	50 00	.....	.....
Runners.....	30	1,185	606 32	620½	140	30½	309	.....	.....	294 00	.....	.....
Railroads.....	39	2,858	159 83	1,694½	185½	1,032	.....	1½	.....	1,008 00	.....	.....
Burning building.....	3	18	30 75	3	.....	15	.....	.....	.....	5,190 00	.....	150 00
Clearing land.....	21	258	50 20	.....	59	177½	.....	20	.....	10 00	.....	.....
Incendiary.....	7	350	79 75	28½	.....	98	35	.....	195	.....	.....	.....
Campers.....	23	1,384½	522 51	91	1,328½	14½	.....	4½	.....	135 00	12 00	.....
Lightning.....	10	85	1,114 10	.....	10	10	30	30	15	248 00	.....	.....
Unknown.....	7	299½	44 75	4	15½	200	20	.....	.....	217 00	54 00	.....
Unkown.....	10	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....
Steamer.....	1	.....	2 05	.....	.....	.....	.....	.....	.....	.....	.....	.....
Log drivers.....	2	165	7 40	65	.....	40	.....	.....	.....	.....	.....	.....
Accidental.....	1	10	37 25	.....	10	.....	.....	.....	.....	110 00	.....	.....
From adjoining town.....	1	45	12 15	25	20	.....	.....	.....	.....	10 00	.....	.....
Hot air balloon.....	1	.....	3 30	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	205	8,058	\$4,535 25	2,641½	2,206½	2,100½	430	397½	282	\$7,912 00	\$1,706 00	\$200 00
CATSKILL REGION												
Railroads.....	21	2,064	\$171 65	605	1,133½	325½	.....	.....	.....	\$4,530 00	.....	.....
Logging engines.....	2	61	14 70	.....	61	.....	.....	.....	.....	296 50	.....	.....
Burning building.....	6	263	55 50	74	189	.....	.....	.....	.....	275 00	25 00	.....
Smokers.....	8	530	403 50	63	167	.....	300	.....	.....	140 00	.....	.....
Clearing land.....	3	495	36 19	15	23	457	.....	.....	.....	1,837 00	30 00	.....
Incendiary.....	15	1,103	402 07	678	275	.....	150	.....	.....	.....	.....	.....
Children.....	2	4	13 35	4	.....	.....	.....	.....	.....	.....	.....	.....
Runners.....	11	77½	237 72	27	39½	.....	11	.....	.....	102 00	5 00	.....
Unknown.....	3	24	56 45	17	5	2	.....	.....	.....	90 00	.....	.....
Lightning.....	1	1	1 80	1	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	72	4,621½	\$1,452 93	1,483½	1,892½	784½	461	.....	.....	\$7,270 50	\$715 00	.....
SUMMARY												
Adirondacks.....	205	8,058	\$4,535 25	2,641½	2,206½	2,100½	430	397½	282	\$7,912 00	\$1,706 00	\$200 00
Catskills.....	72	4,621½	\$1,452 93	1,483½	1,892½	784½	461	.....	.....	7,270 50	715 00	.....
Totals.....	277	12,679½	\$5,988 18	4,125	4,099	2,885½	891	397½	282	\$15,182 50	\$2,421 00	\$200 00

Total expense does not include regular and special patrol services at fires.

The entire expense of fire protection is paid by the State, *i. e.*, the salaries and expenses of the superintendents of fires and patrolmen, also the cost of construction and maintenance of observation stations and the wages of special patrolmen. The expense of actual fire fighting other than the above, is paid in the first instance by the State at the rate of fifteen cents per hour for time employed, and later, one-half such charge is rebated to the State by the town in which the fire occurred. The amounts expended for actual fire fighting were as follows:

EXPENSE OF FIGHTING FIRES, 1910

Adirondacks

CLINTON COUNTY

Ausable	\$11 55	Ellenburgh	\$5 00
Altona	101 70	Mooers	46 45
Black Brook	253 55		
Total			\$418 25

ESSEX COUNTY

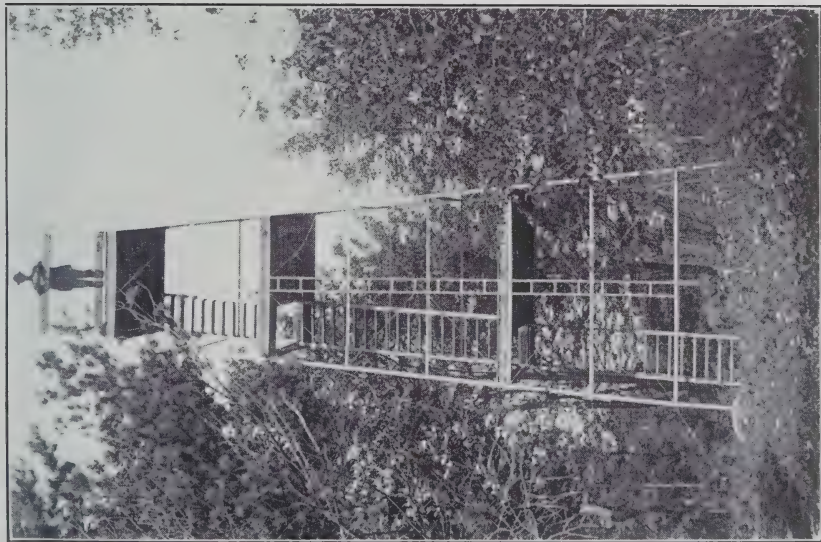
Chesterfield	\$16 80	Moriah	\$14 11
Elizabethtown	23 50	North Hudson	53 10
Jay	22 65	North Elba	92 20
Keene	109 50	St. Armand	11 70
Lewis	15 00	Schroon	44 65
Minerva	12 00	Westport	9 15
Total			\$728 37

FULTON COUNTY

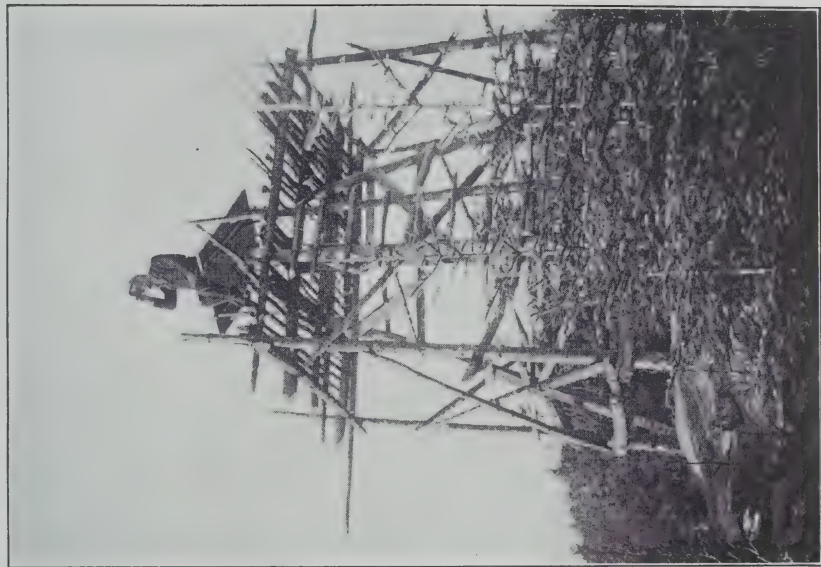
Bleecker	\$31 30	Mayfield	\$13 50
Johnstown	27 30		
Total			\$72 10

FRANKLIN COUNTY

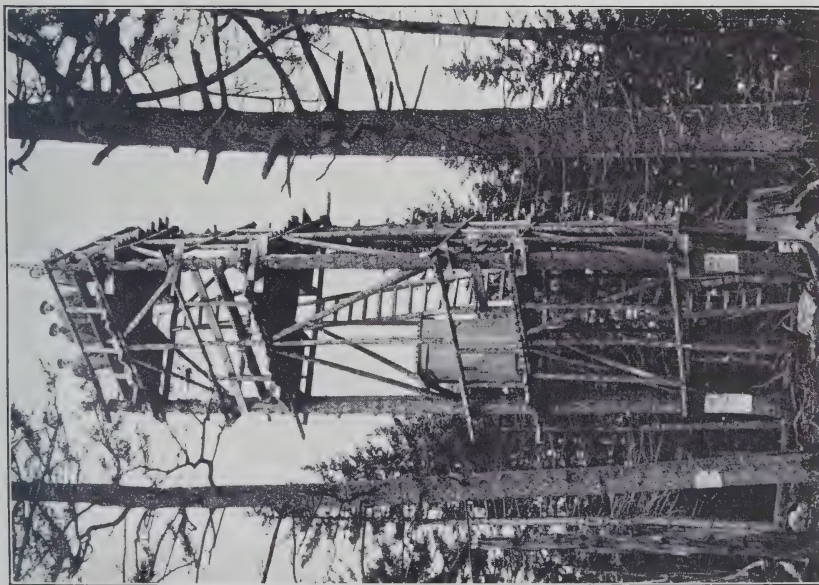
Altamont	\$11 70	Harriettstown	\$1,162 26
Belmont	26 75	Santa Clara	193 45
Brighton	5 00	Waverly	18 90
Franklin	103 50		
Total			\$1,521 56



Fire Tower on Twadell Point (45 feet high),
East Branch, N. Y.



Observation Station on Gore Mountain, Warren County
(18 feet high).



Observation Tower on Hunter Mountain, Greene County
(40 feet high).



Observation Tower on Balsam Lake Mountain, Ulster
County (35 feet high).

HAMILTON COUNTY

Arietta	\$14 83	Lake Pleasant	\$47 25
Benson	2 25	Long Lake	38 50
Indian Lake	505 42	Wells	27 90
Inlet	13 50		
Total			\$649 65

HERKIMER COUNTY

Ohio	\$2 05	Webb	\$21 60
Salisbury	58 27	Wilmurt	4 50
Total			\$86 42

LEWIS COUNTY.

Croghan	\$58 55	Lyonsdale	\$33 90
Diana	52 35	Watson	440 33
Greig	3 75		
Total			\$588 88

ONEIDA COUNTY

Boonville	\$134 82	Forestport	\$11 41
Total			\$146 23

SARATOGA COUNTY

Corinth	\$29 05	Edinburgh	\$15 00
Day	3 15	Hadley	43 82
Total			\$91 02

ST. LAWRENCE COUNTY

Clifton	\$78 41	Fine	\$13 20
Canton	268 75	Macomb	24 00
Colton	30 15	Piercefield	29 65
Total			\$444 16

WARREN COUNTY

Caldwell	\$162 50	Luzerne	\$16 80
Chester	39 25	Stony Creek	18 00
Hague	11 55	Thurman	8 10
Johnsburgh	126 40	Queensbury	7 50
Total			\$390 10

WASHINGTON COUNTY

Fort Ann	\$39 00	Whitehall	\$1 50
Putnam	10 65		
Total	\$51 15		

Total amount for the Adirondacks..... \$5,916 25

Catskills

DELAWARE COUNTY

Andes	\$4 65	Hancock	\$182 00
Colchester	37 74	Middletown	33 89
Davenport	26 30		
Total	\$284 58		

GREENE COUNTY

Jewett	\$4 35	Lexington	\$83 50
Total	\$87 85		

ULSTER COUNTY

Denning	\$7 50	Shawangunk	\$5 00
Gardner	52 50	Shandaken	402 26
Kingston	18 75	Saugerties	5 25
New Paltz	7 95	Wawarsing.....	343 85
Olive	23 70	Woodstock	6 00
Rochester	157 70		
Total	\$1,030 46		

SULLIVAN COUNTY

Cochecton	\$20 40	Liberty	\$4 05
Delaware	34 70	Lumberland	57 15
Forestburgh	69 00	Mamakating	99 60
Freemont	30 00	Tusten	10 10
Highland	7 00		
Total	\$332 00		

Total amount for the Catskills..... \$1,734 89

Total amount for Adirondacks and Catskills..... 7,651 14



Steel Fire Lookout Tower on Belle Ayre Mountain (65 feet high), Pine Hill, N. Y.

OBSERVATION STATIONS

There are at present twenty observation stations maintained, where observers are on the watch for forest fires. This number includes nine which were in operation last year and eleven which were constructed during the past winter and spring. The names of the stations, their location, date of installation, costs and other information in regard to them are submitted herewith.

A report of the fires observed from each station follows. The number of such fires does not agree with the total number of fires that occurred because many of the fires burned early in the season and before the stations were equipped. There are also fires that were not observed from any stations because some localities are not sufficiently near or in proper range of the observers. This emphasizes the necessity of more stations properly located.

RECORD OF FIRE REPORTED FROM OBSERVATION STATIONS. SEASON OF 1910

NAME OF STATION	County	Observer	Number of Fires
Lyon Mountain station.....	Clinton.....	J. H. Baxter.....	3
Hurricane Mountain station.....	Essex.....	Jos. Denton.....	3
Pharoah Mountain station.....	Essex.....	A. L. Pitkin.....	6
Whiteface Mountain station.....	Essex.....	M. L. Reed.....	7
Mt. Morris station.....	Franklin.....	Richard Gile.....	16
St. Regis Mountain station.....	Franklin.....	Geo. F. Brown.....	55
Ft. Noble Mountain station.....	Herkimer.....	Perry Cole.....	0
Beaver Lake Mountain station.....	Herkimer.....	John H. Bintz.....	1
Cat Head Mountain station.....	Hamilton.....	Seth Wadsworth.....	1
Snowy Mountain station.....	Hamilton.....	Frank Washburn.....	16
Hamilton Mountain station.....	Hamilton.....	Alfred Pelcher.....	3
West Mountain station.....	Hamilton.....	Cal La Prairie.....	1
Moosehead Mountain station.....	St. Lawrence.....	J. W. Hinkson.....	9
Cat Mountain station.....	St. Lawrence.....	G. A. Muir.....	3
Core Mountain station.....	Warren.....	F. J. Whaley.....	12
Prospect Mountain station.....	Warren.....	Arthur Irish.....	13
Twadell Point station.....	Delaware.....	John B. Hawk.....	0
Belleayre Mountain station.....	Ulster.....	C. Y. Persons.....	13
Balsam Lake station.....	Ulster.....	Edward Avery.....	4
Hunter Mountain station.....	Greene.....	A. J. Connolly.....	3
Total.....	.....	.....	169

OBSERVATION STATIONS

NAME OF STATION	LOCATION		Date of installation	Miles of telephone line built	Height of tower	MILES OF UNOBSTRUCTED VIEW				Cost of construction
	Town	County				Easterly	Southerly	Westerly	Northerly	
Pharoah Mountain.....	Schroon.....	Essex.....	April, 1910	5	None	15	25	20	20	\$269 42
Hurricane Mountain.....	Keene.....	Essex.....	April, 1910	2	None	15	5	10	10	110 04
Whiteface Mountain.....	Wilmingon.....	Essex.....	July, 1909	7	None	20	15	12	20	1,559 31
St. Regis Mountain.....	Santa Clara.....	Franklin.....	April, 1910	3	None	12	15	35	25	294 17
Mount Morris.....	Altamont.....	Franklin.....	July, 1909	6	None	20	22	15	25	224 84
Lyon Mountain.....	Saranac.....	Clinton.....	April, 1910	3	None	10	8	15	20	235 01
West Mountain.....	Long Lake.....	Hamilton.....	July, 1909	6	12 feet	20	30	15	28	1,804 44
Fort Noble Mountain.....	Morehouse.....	Hamilton.....	July, 1910	1	30 feet	14	59	15	18	300 56
Hamilton Mountain.....	Lake Pleasant.....	Hamilton.....	Oct., 1909	5	18 feet	20	32	35	12	984 31
Snowy Mountain.....	Indian Lake.....	Hamilton.....	Aug., 1909	11	15 feet	40	20	13	25	980 02
Cat Head Mountain.....	Benson.....	Warren.....	June, 1910	2	18 feet	25	29	18	25	138 48
Gore Mountain.....	Johnsburgh.....	Warren.....	Aug., 1909	1	35 feet	15	5	30	25	107 46
Prospect Mountain.....	Caldwell.....	St. Lawrence.....	July, 1910	1	37 feet	28	30	30	20	698 90
Cat Mountain.....	Clifton.....	St. Lawrence.....	June, 1910	5	20 feet	6	7	15	15	442 20
Moosehead Mountain.....	Webb.....	Herkimer.....	July, 1910	5	None	10	10	19	4	308 39
Beaver Lake Mountain.....	Hardenburgh.....	Ulster.....	May, 1909	2	35 feet	12	18	17	14	38 40
Belleayre Mountain*.....	Shandaken.....	Greene.....	Aug., 1909	6	65 feet	10	11	13	14	362 50
Hunter Mountain.....	Hunter.....	Delaware.....	Aug., 1909	7	40 feet	7	6	18	12	225 21
Twadell Point.....	Hancock.....	Delaware.....	May, 1910	1	45 feet	20	20	18	10	307 70

* Tower already in use for observation purposes, and not built by the state.

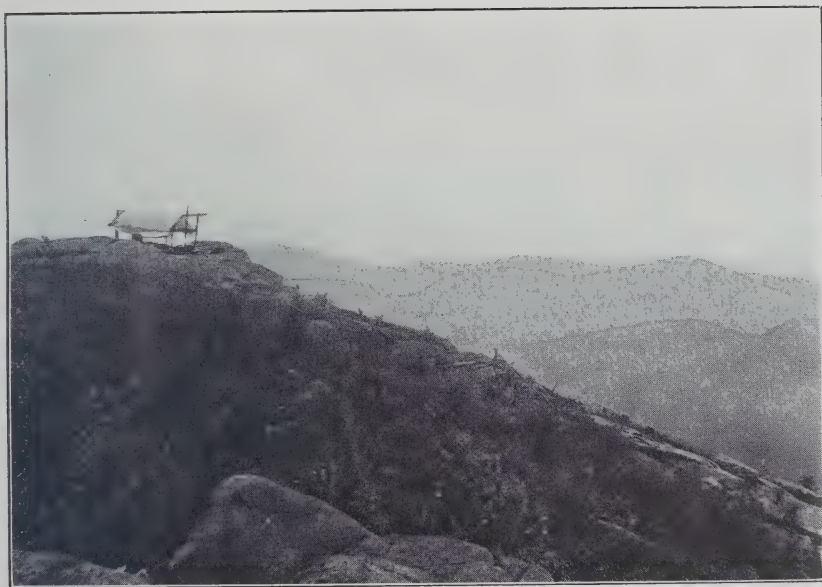


Photo by Samuel Russell.
Observation Station on Pharaoh Mountain, Essex County.



View from Twadell Point Observation Station, Delaware County.

The value of observation stations has been fully demonstrated. In a section like the Adirondacks, with so much wild land frequented by fishermen, hunters, campers and others, it is absolutely necessary to have some means of guarding the county at all times and getting men to the fires while they are still so small that they can be controlled. The former method, waiting until the smoke from a fire was so voluminous that it attracted attention several miles away, is too precarious and causes not only great property losses, but forest destruction. The "smokes" are now observed when the fires are in their incipency and the nearest patrolman or supervisor is notified by telephone, in order that the fire may be attacked promptly. The cost of construction and maintenance is nothing in comparison with the property saved, forest protected and reduction in cost of fire fighting. The number of stations should be increased to at least thirty, all of them properly equipped but not all necessarily manned except in periods of danger.

The value of observation stations is easily indicated when one considers the great extent of country over which they have range. The number of men that would be required to effectually patrol the same acreage would be at least twenty times as many. The observer quickly perceives the first indications of fire and orders men to that point. They are also able to inform the patrolmen as to the size and nature of the fire and, therefore, the person going to the fire can make better arrangements and accomplish much better results.

FALLOW FIRE LAW

The fallow fire law should be changed to eliminate "smokes" during the fire season and at the same time to better meet the demands of land owners who desire to set fires to clear land. At the present time, setting fires for the above purpose is prohibited from April 21st to May 31st, inclusive, a period in the spring when vegetation is dead; and again from September 16th to November 10th, inclusive, but such fires may be started from June 1st to September 15th, if written permission has been secured. This law does not satisfy the land owner because he desires to cut his wood during the winter, burn the fallow the coming spring and plant

a crop the same season. It also seriously interferes with the efficiency of our fire protective system, adds an unnecessary expense and often leads to violation of the law. It is impossible to make our system effective unless every fire is attacked promptly, therefore it is necessary to determine the cause of every smoke regardless of whether permits have been issued or not. This is too heavy a burden upon our limited force, produces a large expense and the burning could be done before the fire season with safety. The statute should be amended in order to obviate both these troubles. Section 73, Fires to Clear Land, should be changed and permit burning from November 1st to May 15th inclusive and during the remainder of the year absolutely prohibit it. No fires should be set between April 1st and May 15th, inclusive, without the written permit of an officer duly authorized by the Commissioner, and if any fires did occur during the prohibited season, where it was evident that the purpose of such fires was to clear land, then it would be prima facie evidence that such fires were set by the owner or occupant for this purpose and would constitute a violation. This section should be further amended to include the town of Hopkinton, St. Lawrence county, because it contains such a large area of forest.

The expense incurred by this department in connection with the clearing of land is considerable, and furthermore consumes a large amount of valuable time of the field force. An idea of the extent of the burning may be obtained from the following table:

<i>Record of Fire Permits Granted</i>			
Counties	1909	1910	
Clinton	96	54	
Essex	92	83	
Fulton	49	20	
Franklin	28	28	
Hamilton	35	49	
Herkimer	12	6	
Lewis	42	70	
Oneida	9	....



Observation Tower on Fort Noble Mountain, Herkimer
County. Height 50 Feet.

Counties	1909	1910
St. Lawrence	175	101
Saratoga	36	43
Warren	55	64
Delaware	78	60
Greene	18	15
Ulster	22	88
Sullivan	28	....
Total	<u>775</u>	<u>681</u>

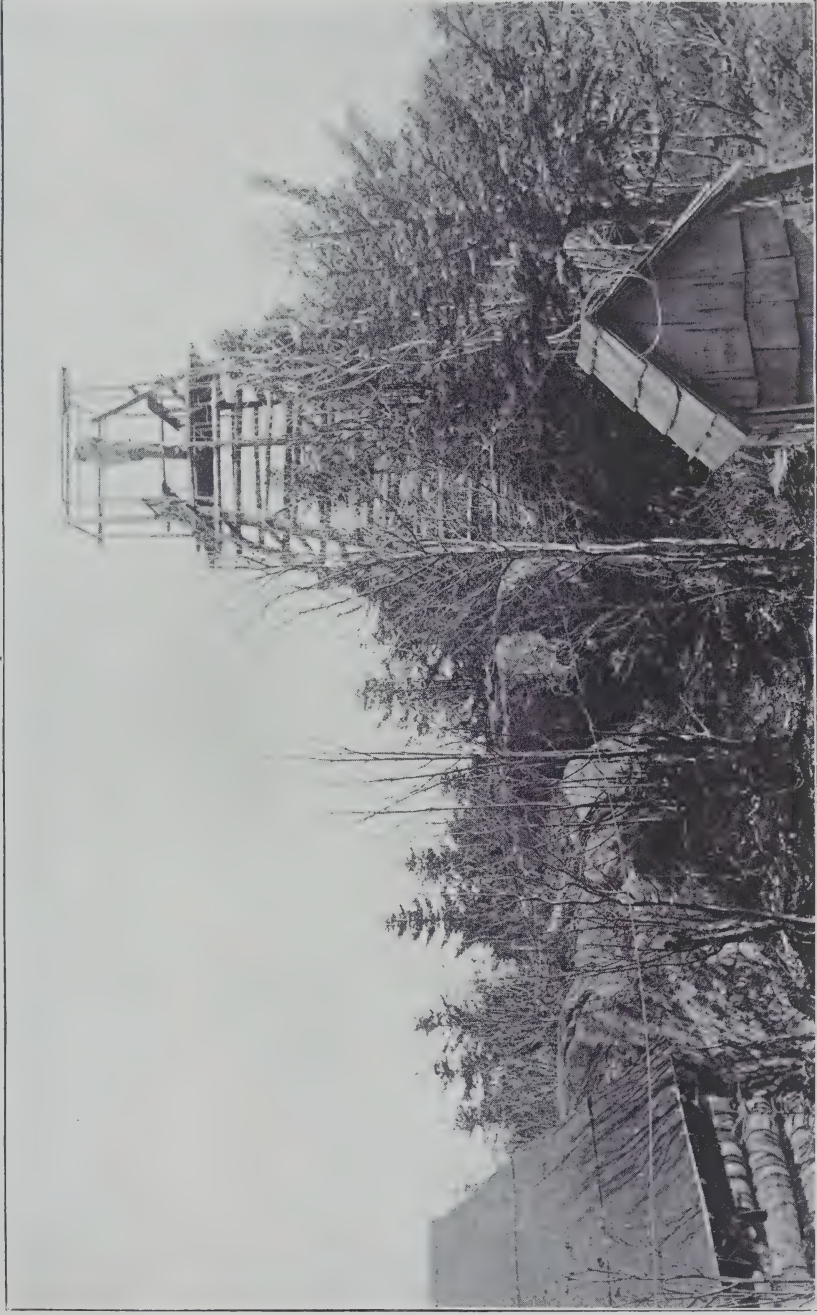
The law should be amended and distinctly authorize the appointment of two kinds of patrolmen. They could be designated regular and special. The former to be employed either during the fire season or throughout the entire year and paid a salary and devote their entire time to the work. The latter to be selected on account of their special fitness and knowledge of the country and location. They should be competent men who could be employed as regular patrolmen under salary in case of extreme drought and in case of fire originating in their locality, have full authority to employ men and take general charge of extinguishing any such fire. They should be paid jointly by the town and State in case of fire fighting, but if employed temporarily on regular patrol duty, they should be paid a salary by the State. The supervisors should either be eliminated from the fire force or be made responsible for the duties imposed under the fire law. The supervisors are, as a rule, business or professional men, usually too busy to attend to fires and often without sufficient experience to properly undertake the work. If they were entirely eliminated from the force in the forest towns, the desirable ones could be appointed special patrolmen or other persons in the same locality could be so appointed. If the special patrolmen were competent, able men, selected by the Commissioner with the advice of the large land owners who are most interested in preventing and promptly extinguishing fires, a much better force would result and better protection would be secured. The law should be further amended to permit the payment

for tools and other necessary expenses in connection with fires to be a joint charge between the town and State.

In many cases supervisors do not render bills to the State until several months after the fire occurred, when it is difficult to secure the necessary information in regard to the case and fully determine if the accounts are proper. The law should be amended, requiring such bills to be filed in this office within thirty days after such fire is extinguished, in order to secure any financial assistance from the State.

The great loss of forest property by fire in the Lake States and in the northwest has awakened the keenest criticism in regard to their laws and methods. Such losses can be almost entirely prevented with a properly organized force and sufficient funds to maintain it. The land owners of Oregon and Washington have their own force organized quite similarly to ours, but the cost of maintenance is paid directly by the land owners voluntarily and upon a basis of acreage protected. This organization was so effective that forests, in regions equally dry and exposed as that where the worst fires occurred in the northwest, escaped without loss. The time has come when forest property must be guarded the same as any other. We cannot depend upon sentiment or charity to do this work. A competent force of efficient, active men familiar with the country and experienced in fire fighting must be maintained. The value of the forests to the people are so great and the benefits to be derived so varied and important that the expense is not to be considered; yet the cost is a very small part of the advantages secured and only pennies are expended where dollars are saved. Our present fire law has attracted so much attention that the writer was invited to explain it at a meeting of New England States forestry interests held at Mt. Washington, N. H., last August and again at the Lake States Forest Fire Conference at St. Paul, Minn., the present month.

There is still much work to be done, not only in perfecting and maintaining the organization for actual fire fighting, but in protection. The people who live in our forest sections and those who use the woods for hunting, fishing, camping, recreation and health



Hamilton Mountain Station, Hamilton County. Tower 18 Feet High.

must realize that they have responsibilities. They must feel this responsibility and be far more careful and exercise better judgment in starting fires; and above all, see that fires are absolutely extinguished before leaving them. The two largest areas burned over this year were due to these causes and were truly avoidable simply by exercising reasonable care.

At the present time there is some criticism in various parts of our forest sections because people are not allowed the free and full use of wild lands for hunting and fishing. In many cases the land owners do not care anything about the game but they are afraid of fires and in order to protect their property it is necessary to prohibit persons going upon it.

During the year several actions have been commenced, convictions secured and fines enforced for setting fires to clear land without permits and during the prohibited season. In addition one conviction was secured in case of setting fires to wild land in the Shawangunk Mountains in order to increase the blueberry crop. This is the first conviction of this kind ever secured in Ulster county and was extremely difficult because the accused was a veteran of the Civil War.

RAILROADS AND FIRES

During the year a decided effort has been made to have the railroads comply with the law relative to the clearing of their rights of way through forest land in the sixteen forest preserve counties. In order to secure a better understanding and discuss fully all matters in regard to forest fires, in so far as the Adirondack railroads are concerned, a conference was held at Saranac Lake, August 29th. The following representatives of the railroads were present:

N. Y. C. & H. R. R. R.:

Hon. M. E. McCleary.... Attorney,
G. N. Edmondson..... Asst. Engineer,
Joseph Welch..... Supt. of Tracks, M. & M. Div.
F. L. Vault..... Supt. of Tracks, M. & M. Div.
M. Keefee..... Supt. of Tracks, N. Y. & O. Div.

J. Crowley..... Supt. of Tracks, Rutland Div.,
 W. A. Deans..... Master Mechanic, M. & M. Div.,
 Melvin Graves..... Rd. House Foreman M. & M. Div.,

D. & H. R. R.:

J. A. McGrew..... Chief of Maintenance of Ways,
 M. D. Dorsey..... Road Master,
 H. R. Bristol..... Supt. Woodlands,
 Fred'k Billard..... Asst. Supt. Woodlands,

The State was represented by:

PUBLIC SERVICE COMMISSION:

Mr. A. Buchanan, Jr..... Supervisor of Equipment,

FOREST, FISH AND GAME COMMISSION:

C. R. Pettis..... Supt. State Forests,
 C. J. Gibson..... Chief Railroad Inspector,
 M. C. Hutchins..... Supt. of Fires, First District,
 A. I. Vosburgh..... Fire Patrolman.

This meeting brought about a thorough understanding, and ever since all work in these counties has proceeded far better than before. The railroads expressed a willingness to cooperate, in order to reduce fires, and have put forth a determined effort to put their rights of way in such condition that fires will not readily ignite and by removal of material, decrease as far as possible the danger. These lines are not yet in satisfactory condition, but it is hoped they will be thoroughly cleared the coming season.

There has been a decided decrease in the number of railroad fires in the Adirondacks the past year, due to the operation of oil burning locomotives during the day time. The order of the Public Service Commission, which caused the change of fuel, did not become entirely effective until August 1st, and during the spring there were many fires which started from sparks or cinders. The railroads feel that it is a hardship to burn oil and also thor-

oughly clean their rights of way, but under the present law there is no other alternative for this Commission, and as long as they use oil burners for only a portion of the year and then only during the day, the fire risk is sufficiently hazardous to need this protection.

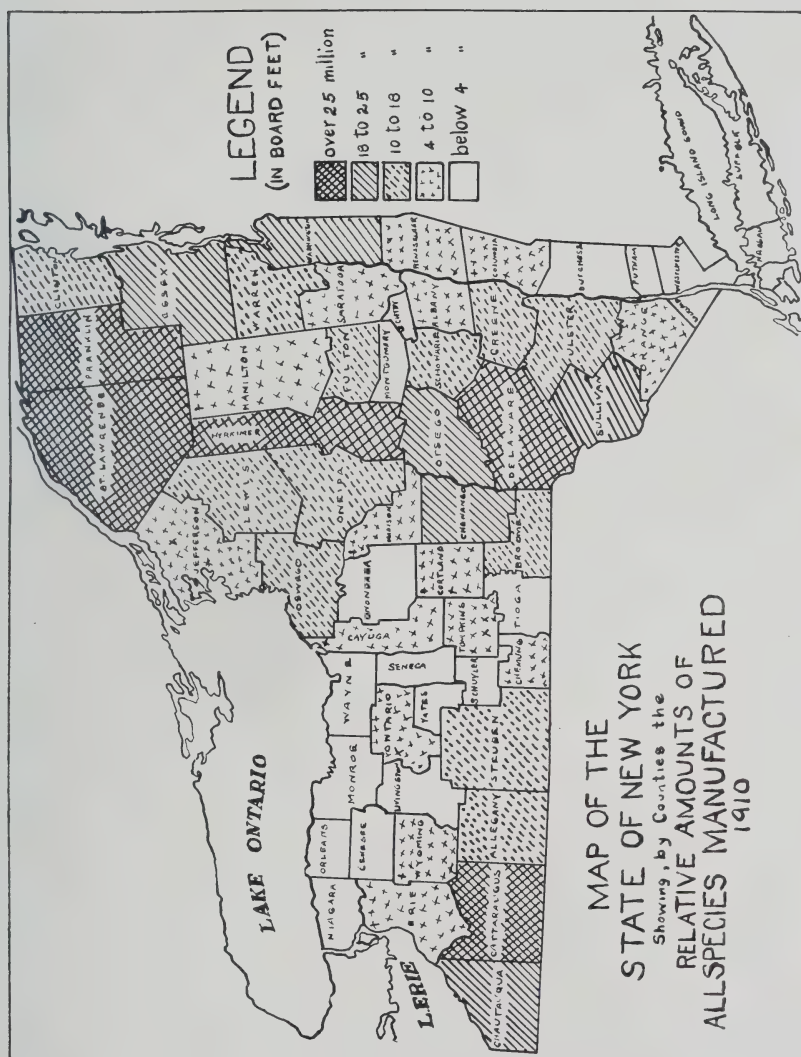
TOP LOPPING LAW

The top lopping clause, which is a part of the fire law, has been subjected to some criticism and has, in places, been difficult to enforce. At present the law applies to all of the sixteen forest preserve countries, while the section relative to setting fires to clear land and our jurisdiction in the enforcement of all other parts of the fire law applies to only ninety-four towns in the central portion of the Adirondacks and Catskills. There is no good reason why we should be charged with the enforcement of this law in a territory larger than where we are responsible for fire protection. The law should be amended to apply only to the towns enumerated in section 73. This law was signed by the Governor late in May, 1909, but was not fully enforced last year. This season an effort has been made to secure a compliance with the law with quite uniform success. The fire patrolmen make systematic inspections and but few violations are occurring at this time. These violations are nearly all on small jobs, often only twenty to thirty trees cut by some farmer who claims ignorance in regard to this law.

The greatest difficulty with this law at the present time is to actually determine what is a compliance. The law reads "Every person who shall, within the forest preserve counties of the state, cut or cause to be cut, or allow to be cut any coniferous trees for sale or other purposes, shall cut off or lop or cause to be cut off or lopped from the said trees at the time of cutting the said trees, all the limbs or branches thereof, unless the said trees be cut for sale and use with the branches thereon." There are many operations where the wood material in the fallen tree is removed down to as small a diameter as three and in some cases two inches, in which case but a small stubbed top is left, but as this leaves limbs

fastened to the remaining stem, it is not a compliance with the law, although in some cases it is possible that the result which the law intended to accomplish will be secured. On the other hand, large limbs are left with side branches, much larger and more dangerous than this small top, yet the law has been fully complied with. In some sections peeling hemlock bark is still quite an industry and it can be peeled only when it is loose, usually during the month of June. In these localities it has been the custom to fell the trees, peel the bark and defer cutting the trees into logs until later in the season, when help is more plentiful or cheaper. In such cases the trees were cut into logs often two months after felling and the parties agreed to lop the branches when the logs were removed. To absolutely require an immediate compliance with the law, is to cause the owner or operator considerable loss, yet the law explicitly states that the tops shall be trimmed at the time of felling. There are other cases where operations are conducted both for lumber and wood. The trees are first felled and the logs removed, then later the tops cut into wood. The time between the two operations may be a month or more, and perhaps during the fall or winter when there is no fire danger. The law should be so changed that some one could exercise some discretion in these matters, but at present these are violations and must be so construed.

The purpose of the law is excellent and is a desirable one. Complaints on account of its enforcement are very limited and are almost entirely from small jobbers whose only interest is to make as much money as possible out of the operation, regardless of the condition of the forest. The stumpage owners are decidedly favorable to this law and no trouble has been experienced through the operations on the property of our large operators this year.



FOREST PRODUCTS

LUMBER

The statute prescribes that the Superintendent of Forests shall make an annual report showing the amount of lumber manufactured and wood used for commercial purposes from timber grown within the State. These figures have, as has been the custom for some years, been secured. The work was done in cooperation with the United States Forest Service and has been accepted and published by the Bureau of Census. The work was done in this office and reports received from 2308 mills. In order to secure and tabulate these figures, a large amount of correspondence and office work has been necessary which Mr. Pierce E. Beswick has conducted most diligently.

The statistics for the first time have been tabulated by counties and the various figures will be found in the accompanying tables. Maps have also been prepared showing the production of a few of the leading species with varying shading for each county depending upon the quantity reported. The maps and the figures indicate the production according to the location of the mills manufacturing the lumber or other material and not by place of production because our data is secured from the mill operators.

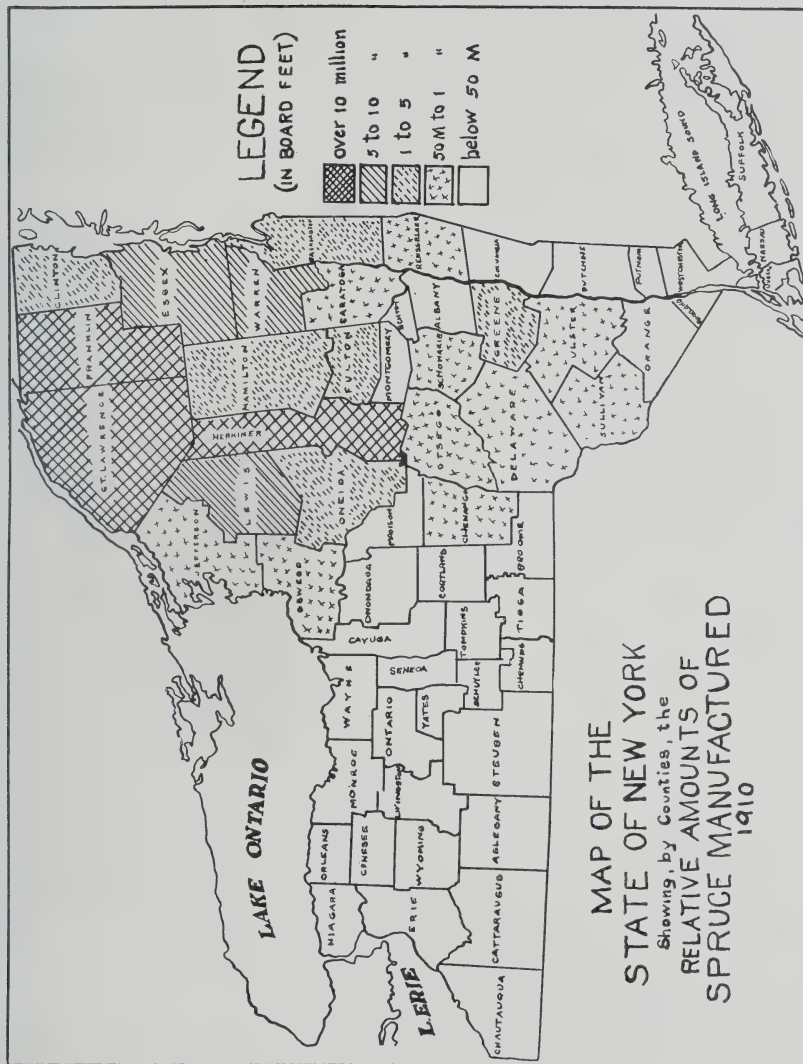
FOREST PRODUCTS BY KINDS AND NUMBER OF MILLS

Product	No. Mills	Quantity
Spruce lumber	451	127,864,000 ft. B. M.
Hemlock lumber	1685	162,783,500 "
Pine lumber	1266	104,658,500 "
Maple lumber	1271	75,023,500 "
Birch lumber	670	31,990,000 "
Beech lumber	939	42,334,500 "
Basswood lumber	1423	36,058,000 "
Elm lumber	765	16,280,000 "
Ash lumber	911	12,747,000 "
Oak lumber	1014	36,520,500 "

Product	No. Mills	Quantity
Chestnut lumber	672	18,829,000 ft. B. M.
Poplar lumber	256	2,351,000 "
Hickory lumber	220	1,426,500 "
Cherry lumber	343	3,327,000 "
Shingle	427	91,888,000 pieces
Lath	441	70,878,300 "
Heading	116	36,735,820 "
Staves	40	69,034,900 "
R. R. ties.....	312	821,040 "
Pulp & Paper.....	39	445,701 cords
Excelsior	13	250,435 "
Wood alcohol	20	
Brick	40	
Cooperage	10	
Lime	6	

PULP WOOD.

The following table has been prepared showing the production and consumption of pulp wood by species and quantity both from native and imported wood. It is readily seen that we are not producing one-half the quantity manufactured and with our large areas of idle soil so near such a large market, there is an excellent opportunity to furnish this supply. At present several of our large operators are rapidly reforesting their lands in order to secure more material.



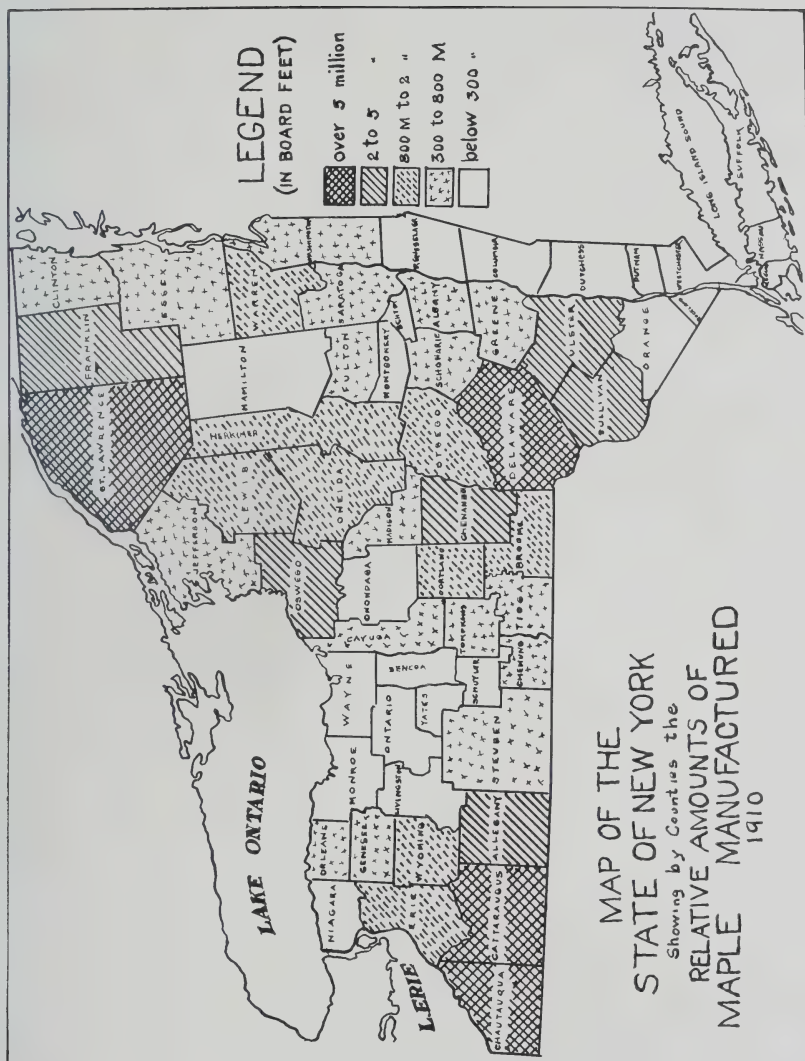
CONSUMPTION OF PULP WOOD.

SPECIES	WOOD GROWN IN THE STATE				Grown outside the State	Grand total
	Cords Rough	Cords Peeled or Rosed	Cords of slabs	Total		
Spruce*.....	269,397	64,004	700	334,101	Cords 451,941	Cords 786,042
Hemlock.....	38,626	.....	.....	38,626	.....	38,626
Pine.....	3,100	.....	.....	3,100	.....	3,100
Poplar.....	.....	39,824	.....	39,824	16,516	56,340
Total.....	311,123	103,828	700	415,651	468,457	884,108

* Includes balsam

FARMING COUNTIES

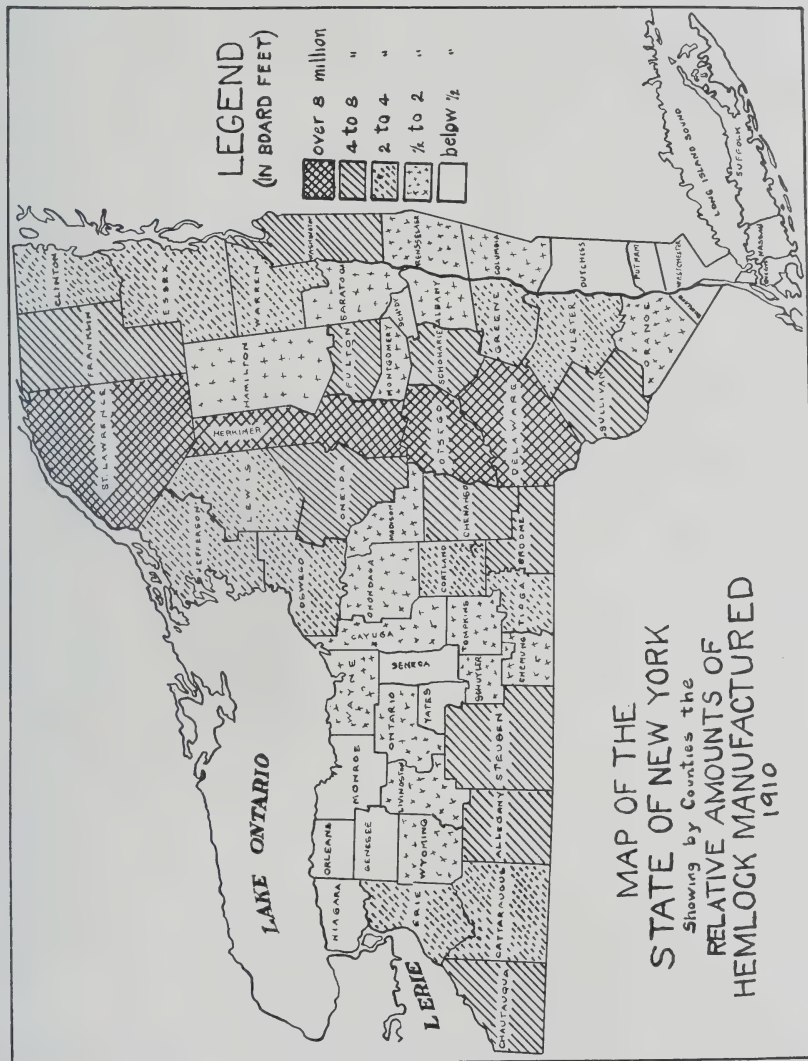
COUNTY	Spruce	Hemlock	Pine	Maple	Birch	Beech	Basswood	Oak
Albany.....	4,000	1,741,000	2,869,000	336,000	3,000	12,000	500,000	556,500
Allegany.....	.....	5,273,000	2,244,000	2,586,000	161,500	1,140,500	1,314,500	1,111,000
Broome.....	.....	4,408,000	1,598,000	1,682,000	353,000	733,000	576,000	1,209,000
Cattaraugus.....	40,000	3,402,500	1,707,500	14,009,000	719,000	4,114,000	2,575,500	1,433,500
Cayuga.....	2,000	657,000	53,000	406,500	14,500	522,500	771,000	368,500
Chautauqua.....	.....	5,080,000	627,000	6,583,000	362,500	4,064,500	1,449,000	419,000
Chemung.....	.....	1,001,000	3,862,500	389,500	125,000	4,109,500	1,166,000	1,147,000
Chenango.....	412,500	7,414,500	2,368,500	2,997,000	688,500	1,462,500	1,809,000	1,131,000
Columbia.....	.....	873,000	1,695,000	241,000	16,000	.....	36,000	2,731,000
Cortland.....	.....	2,534,000	1,146,500	1,161,500	227,000	576,000	772,000	28,000
Dutchess.....	12,000	178,000	307,000	77,500	4,000	19,500	35,000	1,870,000
Erie.....	.....	3,931,000	118,500	1,266,500	73,500	1,422,000	906,000	173,500
Genesee.....	.....	53,000	71,000	616,000	.....	222,000	495,000	112,000
Jefferson.....	860,500	2,784,500	912,000	581,000	535,500	793,500	787,500	118,000
Livingston.....	.....	793,000	436,000	275,000	18,000	44,000	398,000	748,000
Madison.....	.....	1,658,000	812,000	795,500	86,000	156,000	810,000	74,000
Monroe.....	12,500	102,000	91,000	86,000	5,000	100,000	190,000	114,500
Montgomery.....	5,000	1,410,000	1,184,000	40,000	500	100,000	139,000	178,000
Nassau.....	.....	.....	.....	1,000	.....	1,000	.....	40,000
Niagara.....	24,000	38,500	40,000	92,000	.....	15,000	59,500	140,500
Onondaga.....	1,000	608,000	238,000	112,000	2,000	67,000	349,000	26,500
Ontario.....	.....	1,453,000	1,581,500	274,000	36,000	132,500	520,500	1,561,000
Orange.....	.....	710,000	933,500	81,000	7,000	18,000	15,500	1,841,000
Orleans.....	500	338,000	64,000	335,000	40,000	69,000	293,500	237,000
Oswego.....	732,000	2,205,500	623,000	2,777,000	2,085,500	2,254,500	510,000	51,500
Otsego.....	408,000	8,265,500	3,689,500	1,660,000	78,000	1,691,000	1,090,500	908,000
Putnam.....	15,000	177,500	.....	66,000	1,000	10,000	3,000	666,000
Rensselaer.....	537,500	1,281,000	793,500	132,500	589,500	393,000	127,000	815,000
Rockland.....	10,000	1,500	3,000	19,000	6,000	500	.....	176,000
Schenectady.....	.....	139,000	3,000	.....	.....	.....	22,500	.....
Schoharie.....	573,000	5,790,000	5,602,000	706,000	360,500	356,500	1,030,500	1,402,500
Schuyler.....	.....	767,500	4,411,500	62,000	5,000	155,000	157,000	241,500
Seneca.....	.....	144,000	87,000	164,000	4,000	36,000	324,500	226,000



Steuben.....	4,168,000	4,132,500	538,500	220,000	415,500	664,500	1,710,500
Suffolk.....	1,000	76,000	.....	.....	.....	.....	203,000
Tioga.....	2,544,000	2,878,500	786,000	80,000	429,000	277,000	1,860,000
Tompkins.....	1,316,000	1,485,000	667,000	177,000	476,000	648,000	898,000
Wayne.....	920,000	14,000	244,000	49,000	165,500	324,000	31,000
Westchester.....	260,000	2,000	14,500	25,000	120,000	2,000	638,000
Wyoming.....	1,820,000	318,500	853,500	27,000	533,000	1,622,500	184,000
Yates.....	364,000	907,500	221,000	29,000	86,500	303,000	574,000
Totals.....	76,611,500	43,986,000	44,064,000	7,216,000	22,879,000	23,073,500	26,803,500

FARMING COUNTIES — (Continued)

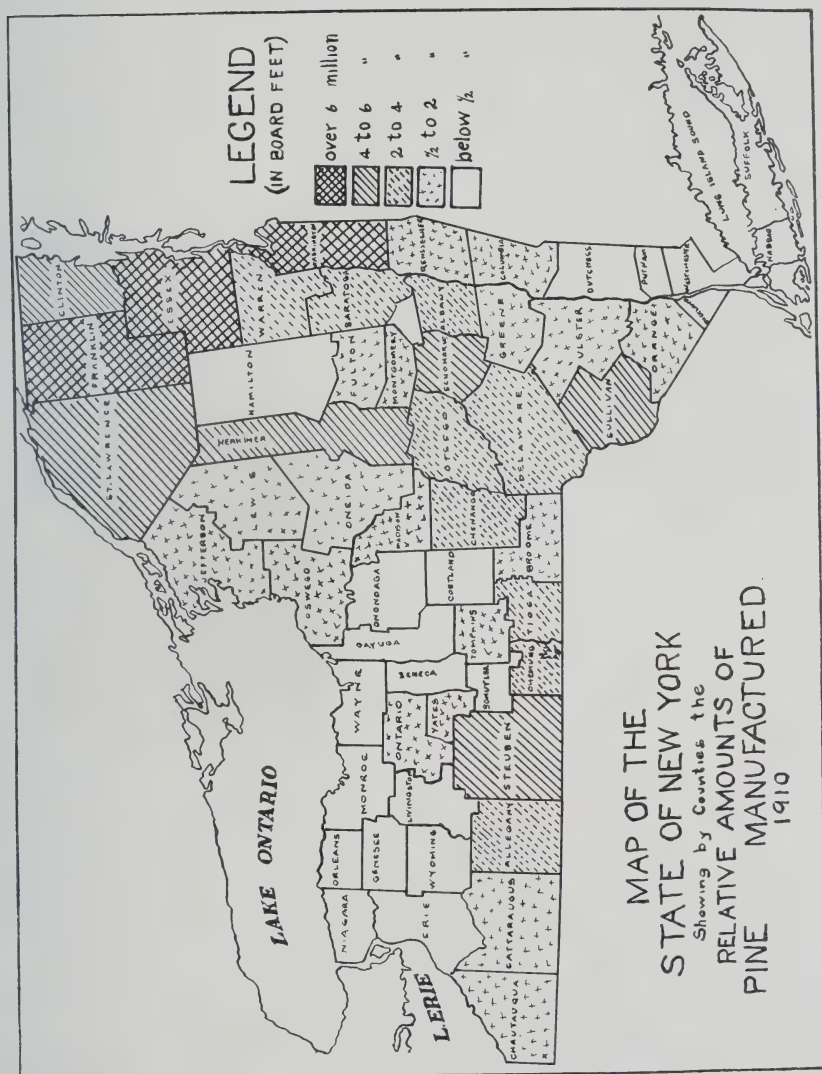
COUNTY	Chestnut	Elm	Ash	Poplar	Hickory	Cherry	Miscellaneous	Total
Albany.....	174,000	77,000	103,000	7,000	43,000	.....	59,000	6,484,500
Allegany.....	886,500	151,500	312,000	107,000	9,500	131,500	247,000	15,075,500
Broome.....	1,002,000	50,000	518,500	43,000	74,000	78,000	306,000	12,044,500
Cattaraugus.....	540,500	594,000	438,000	27,500	11,500	400,500	376,000	28,479,000
Cayuga.....	134,000	557,000	201,500	21,500	56,000	37,500	80,000	3,882,500
Chautauqua.....	320,000	726,000	689,000	65,000	13,000	324,500	124,000	20,885,500
Chemung.....	274,000	1,500	46,500	100,000	.....	9,500	310,000	8,542,000
Chenango.....	1,671,500	198,500	683,500	78,000	12,000	127,000	331,000	21,385,000
Columbia.....	1,342,500	51,500	71,500	13,000	85,000	2,500	277,000	7,435,000
Cortland.....	56,000	55,000	220,000	.....	.....	35,000	118,000	5,929,000
Dutchess.....	716,000	75,000	74,000	.....	.....	.....	151,000	3,627,500
Erie.....	91,000	1,072,500	337,000	27,000	81,500	72,000	250,000	9,840,500
Genesee.....	.....	1,841,000	84,500	36,500	33,500	16,000	9,000	3,583,000
Jefferson.....	10,000	654,500	247,000	27,000	11,000	12,000	153,500	8,487,500
Livingston.....	175,000	176,000	78,000	18,000	6,500	7,000	72,000	3,244,500
Madison.....	7,000	301,500	158,500	5,000	8,500	66,000	305,000	5,225,500
Monroe.....	28,000	283,000	26,000	25,000	1,500	500	65,000	1,122,500
Montgomery.....	20,000	42,500	19,500	7,000	4,000	.....	26,000	3,073,500
Nassau.....	110,000	1,000	.....	4,000	16,000	12,500	7,000	192,500
Niagara.....	10,000	170,000	17,000	.....	20,000	.....	193,500	822,000
Onondaga.....	165,500	238,000	16,000	20,000	4,000	6,000	36,500	1,889,500
Ontario.....	326,500	456,500	100,000	30,000	120,000	15,000	172,000	6,778,500
Orange.....	559,000	33,000	101,000	10,000	211,000	13,500	184,500	4,428,000
Orleans.....	210,000	455,000	89,000	6,500	7,000	9,500	44,000	2,198,000
Oswego.....	77,000	352,500	514,000	2,000	16,000	133,500	308,500	12,042,000
Osage.....	895,000	152,500	233,500	81,000	4,000	49,500	186,500	19,401,500
Putnam.....	1,014,000	32,500	43,500	26,000	83,500	20,000	7,500	2,105,500
Rensselaer.....	312,000	98,500	169,500	80,000	22,000	26,000	80,000	5,367,000
Rockland.....	189,000	1,000	4,500	.....	10,000	500	4,000	425,000
Schenectady.....	1,000	4,000	10,000	.....	.....	.....	.....	170,500
Schoharie.....	105,500	68,000	343,500	144,000	26,000	101,500	255,500	17,045,000
Schuyler.....	57,000	41,500	31,000	.....	.....	.....	19,000	1,948,500
Seneca.....	28,000	385,500	132,500	15,000	28,500	4,500	26,000	1,605,500



Steuben.....	206,500	254,500	376,000	112,000	5,000	5,000	234,000	13,042,500
Suffolk.....	39,000	.....	.....	.....	.....	.....	18,000	397,000
Toga.....	392,000	20,000	107,500	15,000	25,000	9,500	222,000	9,645,500
Tompkins.....	425,500	303,500	247,000	5,000	30,500	36,500	204,000	6,919,000
Wayne.....	35,000	735,500	85,000	.....	10,500	14,500	106,000	2,747,000
Westchester.....	1,082,000	20,500	9,000	27,000	44,000	11,000	46,500	2,301,500
Wyoming.....	82,000	725,000	108,000	1,000	2,000	121,500	201,000	6,605,000
Yates.....	39,500	588,500	100,000	.....	5,500	5,000	107,000	3,330,500
Totals.....	13,809,000	12,105,000	7,145,500	1,191,000	1,207,500	1,914,500	5,916,500	291,584,000

FARMING COUNTIES — (Concluded)

COUNTY	Shingles	Lath	Heading	Staves	Ties	Posts	Poles	Brick and lime kilns, excelsior, wood alcohol, etc., round wood in cords
Albany.....	707,500	510,000	.....	.....	5,500	7,100	192	3,889
Allegany.....	755,000	331,500	510,000	.....	20,508	6,130	5,400	1,330
Broome.....	840,000	708,000	.....	.....	85,363	12,250	690	3,400
Cattaraugus.....	200,000	833,000	540,000	.....	11,255	22,950	850	43,381
Cayuga.....	25,000	160,000	356,000	920,000	450	11,770	40	172
Chemung.....	883,000	691,000	.....	.....	720	2,410	30	1,300
Chenango.....	555,000	264,000	500,000	.....	7,500	1,500	.....	300
Columbia.....	3,760,500	509,000	575,000	1,000,000	76,200	22,665	75	700
Cortland.....	66,000	13,500	.....	.....	27,512	11,278	740	2,710
Dutchess.....	305,000	253,000	.....	.....	.....	2,300	125	875
Erie.....	135,000	671,000	63,000	.....	77,580	14,614	578	6,870
Genesee.....	315,000	.....	200,000	50,000	4,000	5,404	5	2,475
Jefferson.....	2,902,000	254,500	1,854,000	4,089,900	.....	55,275	312	1,317
Livingston.....	83,000	24,000	78,000	.....	.....	11,700	7,000	2,258
Madison.....	502,000	245,000	414,000	135,000	3,450	200	100	40
Monroe.....	300,000	.....	48,000	800,000	.....	1,000	.....	681
Montgomery.....	.....	.....	.....	.....	.....	4,000	100	125
Nassau.....	.....	.....	.....	.....	.....	3,500	150	2,000
Niagara.....	.....	.....	.....	40,000	.....	.....	.....	2,217
Onondaga.....	62,000	98,000	.....	.....	.....	2,500	100	1,000
Ontario.....	320,000	870,000	.....	753,000	300	6,500	757	6,430
Orange.....	45,000	.....	.....	.....	14,266	17,050	600	3,000
Orleans.....	.....	15,000	58,000	.....	.....	1,150	.....	1,800
Oswego.....	158,000	.....	702,000	650,000	10,000	11,200	225	1,845
Otsego.....	2,023,000	2,076,000	705,000	20,000	31,985	42,716	2,330	3,885
Putnam.....	.....	.....	.....	.....	70,000	20,750	1,550	.....
Rensselaer.....	.....	165,000	.....	.....	9,320	19,300	440	4,515
Rockland.....	.....	.....	.....	.....	1,470	1,683	500	8,130
Schenectady.....	.....	.....	.....	.....	.....	500	600	.....
Schoharie.....	522,000	928,500	.....	.....	34,825	3,705	104	.....
Schuyler.....	410,000	115,000	.....	.....	2,897	13,100	26	.....

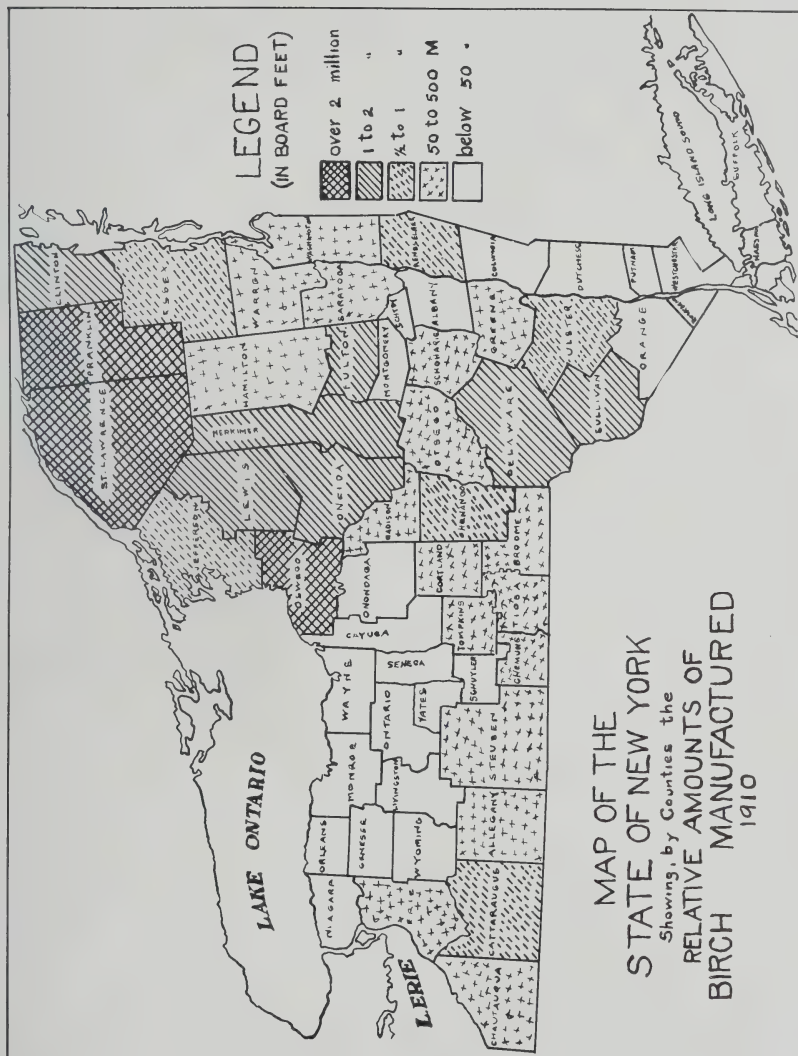


MAP OF THE
STATE OF NEW YORK
Showing by Counties the
RELATIVE AMOUNTS OF
PINE MANUFACTURED
1910

[illegible]

ADIRONDACK COUNTIES

COUNTY	Spruce	Hemlock	Pine	Maple	Birch	Beech	Basswood	Oak
Clinton.....	2,527,000	2,255,000	4,757,000	530,000	1,020,000	132,000	458,000	596,000
Essex.....	5,998,000	3,572,000	10,815,000	340,000	797,000	109,000	433,500	423,000
Franklin.....	32,966,000	7,488,000	6,136,500	2,892,000	3,279,000	1,021,000	871,300	32,000
Hulton.....	4,618,500	5,084,500	1,829,000	762,500	1,405,500	1,569,000	377,500	504,500
Hamilton.....	1,902,500	565,000	173,000	288,000	413,000	30,000	78,000	.....
Herkimer.....	21,100,500	8,156,000	5,210,000	1,886,000	1,932,000	1,133,000	1,339,000	93,000
Lewis.....	6,190,500	3,166,000	779,000	1,194,000	1,550,500	1,028,000	69,000	2,000
Oneida.....	1,610,500	4,041,500	624,000	1,753,000	1,223,000	1,607,000	1,362,500	22,000
St. Lawrence.....	30,455,000	21,393,000	5,869,000	7,806,000	7,876,000	7,272,500	1,396,500	193,000
Saratoga.....	112,000	1,960,500	2,985,000	525,500	331,000	341,000	480,000	571,500
Warren.....	8,168,000	3,495,000	2,800,500	911,000	497,000	490,000	484,500	306,000
Washington.....	3,808,000	5,150,000	6,038,500	494,000	205,000	273,000	701,000	1,382,000
Totals.....	119,456,500	66,326,500	48,016,500	19,388,000	20,589,000	15,077,500	8,625,000	4,125,000

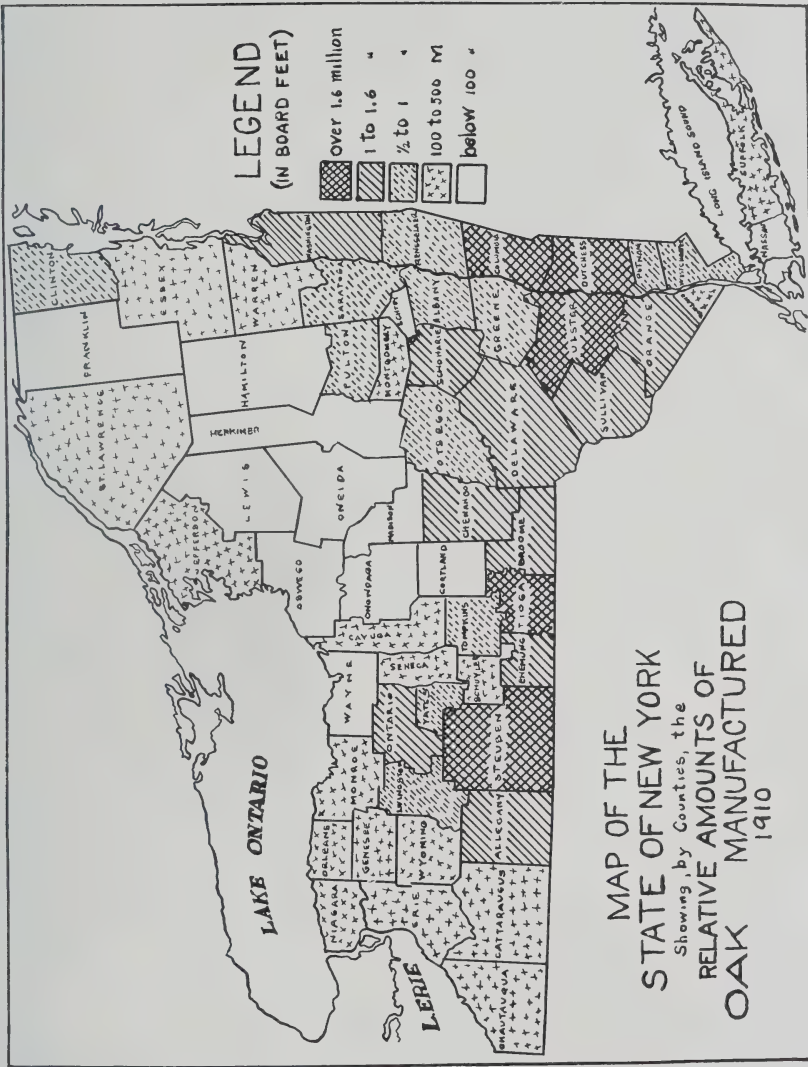


ADIRONDACK COUNTIES—(Continued)

COUNTY	Chestnut	Elm	Ash	Poplar	Hickory	Cherry	Miscellaneous	Total
Clinton.....	55,000	399,500	117,000	104,000	.....	16,000	200,000	13,166,500
Essex.....	4,000	124,000	207,500	48,500	.....	82,000	229,000	23,158,500
Franklin.....	20,000	541,500	240,500	109,000	.....	79,500	172,000	55,854,500
Fulton.....	27,000	39,500	195,000	82,000	.....	39,000	249,000	16,775,500
Hamilton.....	.....	25,500	127,000	39,000	.....	1,000	15,000	3,503,000
Herkimer.....	3,000	301,000	127,000	55,000	.....	42,000	177,000	41,557,500
Lewis.....	.....	280,000	610,000	.....	.....	161,000	105,000	15,660,000
Oneida.....	.....	698,000	335,500	.....	.....	105,000	171,500	13,617,500
St. Lawrence.....	.....	1,251,500	1,743,500	2,000	.....	420,000	457,000	86,437,500
Saratoga.....	422,000	120,000	184,000	98,500	.....	5,000	118,000	8,471,500
Warren.....	219,500	69,500	176,000	63,000	.....	2,500	204,500	17,893,000
Washington.....	495,500	203,000	216,500	72,000	.....	1,000	236,000	19,351,500
Totals.....	1,246,000	4,053,000	4,185,500	831,000	39,000	960,000	2,334,000	315,252,500

ADIRONDACK COUNTIES—(Concluded)

COUNTY	Shingles	Lath	Heading	Staves	Ties	Posts	Poles	Brick kilns, lime kilns, excelsior, wood alcohol, etc., round wood in cords
Clinton.....	4,486,000	1,385,000	650,000	350,000	.....	1,500	600	18,265
Essex.....	1,720,000	2,895,800	.....	.....	.....	4,650	50	75
Franklin.....	8,292,000	9,512,000	8,361,000	52,733,000	11,214	11,600	25	8,374
Pulton.....	575,000	1,252,000	32,000	.....	.....	16,975	500	400
Hamilton.....	365,000	268,000	.....	.....	.....	600	.....	.....
Herkimer.....	864,000	4,588,500	104,000	.....	530	2,450	135	1,326
Lewis.....	1,325,000	1,084,900	545,000	20,000	1,680	2,700	225	5,163
Otsego.....	3,165,000	1,349,000	810,200	2,000	1,000	5,000	.....	1,183
St. Lawrence.....	45,624,000	13,130,000	2,922,000	1,000,000	7,944	27,000	7,060	4,291
Saratoga.....	928,000	729,000	.....	.....	51,900	40,575	1,852	9,971
Warren.....	646,500	10,092,500	.....	200,000	1,900	8,236	600	3,125
Washington.....	.....	3,049,000	589,000	2,500,000	19,940	10,730	1,150	720
Totals.....	67,990,500	49,326,700	14,022,200	56,805,000	94,308	132,916	12,197	52,893



CATSKILL COUNTIES

COUNTY	Spruce	Hemlock	Pine	Maple	Birch	Beech	Basswood	Oak
Delaware.....	394,000	9,818,500	3,212,000	5,800,500	1,793,000	2,400,500	2,815,000	1,597,500
Greene.....	3,937,000	3,019,000	1,960,500	431,000	199,000	65,500	326,500	948,000
Sullivan.....	282,000	4,966,000	5,650,000	2,796,000	1,499,000	1,040,000	541,000	1,099,000
Ulster.....	133,000	2,042,000	1,833,500	2,544,000	694,000	872,000	677,000	1,947,500
Totals.....	4,746,000	19,845,500	12,656,000	11,571,500	4,185,000	4,378,000	4,359,500	5,592,000
SUMMARY								
Adirondack Counties.....	119,456,500	66,326,500	48,016,500	19,388,000	20,589,000	15,077,500	8,625,000	4,125,000
Farming Counties.....	3,661,500	76,611,500	43,986,000	44,064,000	7,216,000	22,879,000	23,073,500	26,803,500
Catskill Counties.....	4,746,000	19,845,500	12,656,000	11,571,500	4,185,000	4,378,000	4,359,500	5,592,000
Totals.....	127,864,000	162,783,500	104,658,500	75,023,500	31,990,000	42,334,500	36,058,000	36,520,500

CATSKILL COUNTIES—(Continued)

COUNTY	Chestnut	Elm	Ash	Poplar	Hickory	Cherry	Miscellaneous	Total
Delaware.....	1,362,500	31,500	711,500	203,000	28,000	321,500	433,000	30,922,000
Greene.....	190,000	12,500	125,500	19,500	55,500	1,500	357,000	11,048,000
Sullivan.....	862,000	13,000	338,000	64,000	30,000	123,000	146,000	19,449,000
Ulster.....	1,359,500	65,000	241,000	42,500	66,500	6,500	60,500	12,584,500
Totals.....	3,774,000	122,000	1,416,000	329,000	180,000	452,500	996,500	74,603,500
SUMMARY								
Adirondack Counties.....	1,246,000	4,053,000	4,185,500	831,000	39,000	960,000	2,334,000	315,252,500
Farming Counties.....	13,809,000	12,105,000	7,145,500	1,101,000	1,207,500	1,014,500	5,916,500	291,584,000
Catskill Counties.....	3,774,000	122,000	1,416,000	329,000	180,000	452,500	996,500	74,603,500
Totals.....	18,829,000	16,280,000	12,747,000	2,351,000	1,426,500	3,327,000	9,247,000	681,440,000

CATSKILL COUNTIES—(Concluded)

COUNTY	Shingles	Lath	Heading	Staves	Ties	Posts	Poles	Brick kilns, lime kilns, excelsior, wood alcohol, etc., round wood in cords
Delaware.....	682,000	3,754,000	2,162,620	142,000	47,867	4,796	300	75,037
Greene.....	1,170,000	1,953,000	44,000	186,000	5,824	1,950	352	1,061
Sullivan.....	433,000	1,827,600	30,000	500,000	13,210	7,184	965	.....
Ulster.....	1,328,000	1,421,000	5,383,500	.....	81,235	13,575	2,472	5,005
Totals.....	3,613,000	8,655,600	7,620,120	828,000	148,136	27,505	4,089	81,123
SUMMARY								
Adirondack Counties.....	67,900,500	49,326,700	14,022,200	56,805,000	94,308	132,016	12,107	52,803
Farming Counties.....	20,284,500	12,806,000	15,093,500	11,401,900	578,596	406,100	24,572	126,442
Catskill Counties.....	3,613,000	8,655,600	7,620,120	828,000	148,136	27,505	4,089	81,123
Totals.....	91,888,000	70,878,300	36,735,820	69,034,900	821,040	566,521	40,858	250,435

REFORESTING

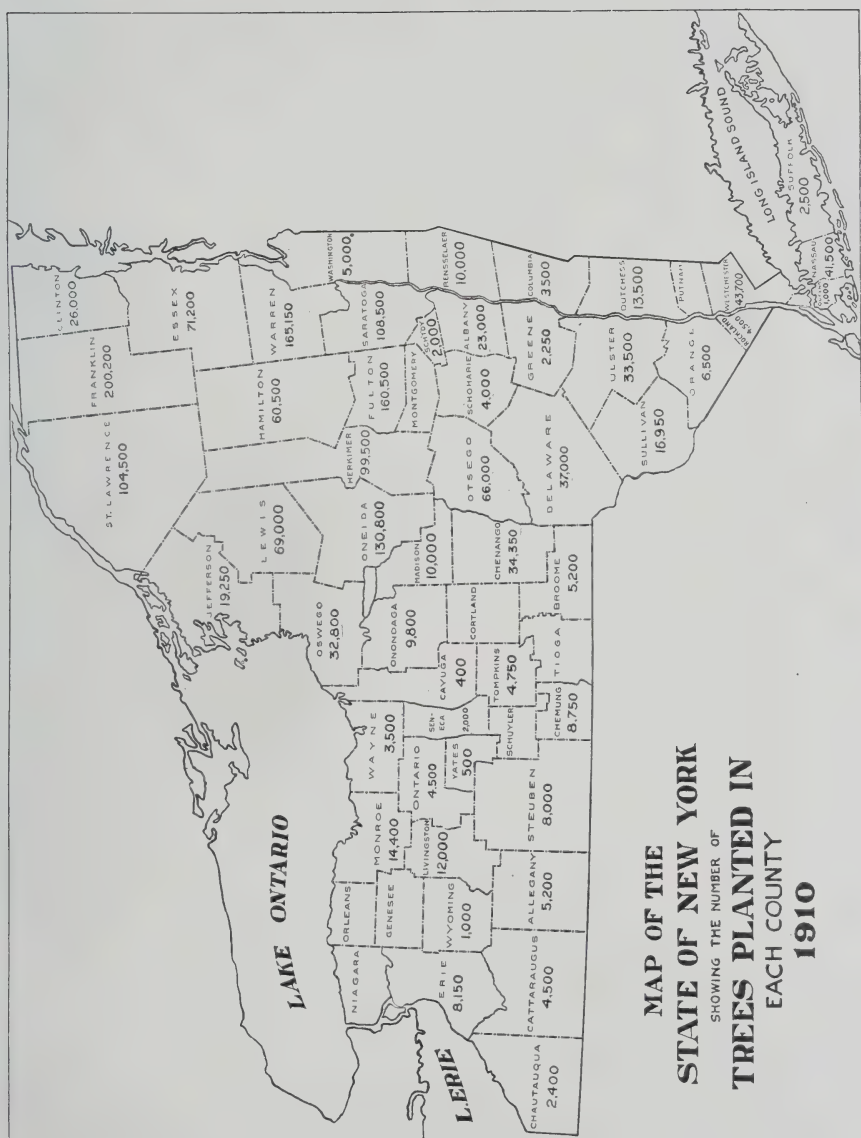
This portion of the departmental work has grown so rapidly and reached such large proportions that it requires the entire time of at least one of our foresters. The five nurseries operated last year have been continued and two of them have been enlarged. Another nursery should be established in the eastern part of the State.

TREE DISTRIBUTION

The demand for information and trees for plantations by private owners increases. The demand for white pine transplants last spring was nearly nine times the supply. The actual supply and demand were as follows:

Species	Supply	Demand	Sales
White pine transplants.	114,810	932,350	114,810
White pine seedlings (2 yr.)	1,457,650	420,200	486,450
Scotch pine transplants. . . .	305,835	135,375	261,835
Scotch pine seedlings (2 yr.)	52,950	115,200	38,950
Bull pine transplants.	44,835	28,475	40,835
Red pine transplants.	133,860	101,150	133,860
Norway spruce transplants.	489,010	424,450	489,010
White spruce transplants. . .	27,600	28,300	27,600
Red spruce transplants.	33,350	15,100	33,350
Balsam transplants.	2,800	20,200	2,800
Black locust seedlings.	52,650	58,100	52,650
Miscellaneous	17,850	.....	17,850
Totals	2,733,200	2,278,900	1,700,000

All of the trees produced in the nurseries were sold to private owners for reforestation purposes except, forty-four thousand Scotch pine and bull pine transplants which were set in the Lake Clear plantation. If the supply had permitted, at least one-half million more trees could have been sold and planted. In some cases single orders of 100,000 white pine transplants were received. It was necessary to grant the applications on a pro rata basis except that



no orders could be filled for less than 500 trees. The white pine transplants were nearly all sold in very small quantities, usually 500 trees and the applicants were offered other trees, such as Scotch or red pine, also Norway spruce, as a substitute, depending upon the quality of the soil and conditions under which the planting was to be done. People seemed anxious to get any kind and very promptly accepted our advice. The result was that a large quantity of Scotch pine and Norway spruce was sold, as well as nearly one-half million white pine seedlings. The eagerness with which the latter were taken has consequently reduced our expected supply of transplants for 1911 to the extent of their purchases.

A summary report of the private planting with trees purchased from this Commission together with other data in regard to the same follows:

SUMMARY OF 1910 TREE DISTRIBUTION—(Continued)

Application number	COUNTY WHERE PLANTED	Total trees planted	Acres planted	Per cent living	Cost of planting per acre including trees	Opinion of reforestation	Estimated acreage in town that ought to be planted
272.....	Herkimer.....	1,000	5	75	.....	Necessary.....	.....
273.....	Saratoga.....	50,000	50	80	\$5 00	Desirable.....	.....
274.....	Lewis.....	24,500	150	90	11 00	Favorable.....	50,000
275.....	(Canceled.)						
276.....	Warren.....	2,500	2½	96	7 00	Good.....	1,000
277.....	Sullivan.....	1,000	1	95	.....	Necessary.....	10 per cent of t'wn
278.....	Orsego.....	10,000	8	80	8 50	.....	.....
279.....	Essex.....	1,000	5	95	.....	Excellent.....	.....
280.....	Albany.....	500	½	95	8 00	Very desirable.....	Many
281.....	Lewis.....	1,000	1½	95	10 00	Investment.....	10 per cent of t'wn
282.....	Steuben.....	3,000	3	.....	.....	.....	Thousands
283.....	Orange.....	6,500	5	98	.....	Excellent.....	.....
284.....	(Canceled.)						
285.....	(Canceled.)						
286.....	Hamilton.....	56,000	75	85	13 00	Investment.....	.....
287.....	Washington.....	1,500	1	85	6 00	Good.....	Many
288.....	Fulton.....	20,000	10	95	8 50	Good.....	Thousands
289.....	(Refused.)						
290.....	Chenango.....	350	.....	100	.....	Favorable.....	100
291.....	Chautauqua.....	100	.....	.....	.....	.....	.....
292.....	Clinton.....	10,000	4	30	7 00	Advisable.....	500
293.....	Ontario.....	2,500	2	90	7 50	Advisable.....	500
294.....	Delaware.....	1,000	¾	95	12 00	Very good.....	.....
295.....	Delaware.....	1,000	3	75	3 50	Advisable.....	5,000
296.....	Sullivan.....	1,000	¾	96	.....	Very good.....	.....
297.....	Westchester.....	2,000	7½	80	7 75	Advisable.....	.....
298.....	Albany.....	8,500	6	.....	.....	.....	.....
299.....	Essex.....	15,500	14	98	13 00	Very valuable.....	5,000
300.....	Jefferson.....	1,250	1½	76	.....	.....	9,000
301.....	Franklin.....	1,500	2	.....	.....	Very favorable.....	5,000
302.....	Lewis.....	1,000	1	90	8 00	Good.....	1,500
303.....	Albany.....	500	.....	.....	.....	Good.....	.....
304.....	Steuben.....	1,500	1	80	9 00	Very favorable.....	5,000
305.....	Oneida.....	500	¾	95	18 50	Desirable.....	Many
306.....	Oneida.....	1,000	1	85	10 00	.....	3,000
307.....	Warren.....	90,000	95	90	4 75	Very good.....	6,000

308.....	Delaware.....	2,000	2	95	5 50	Favorable.....	1,000
309.....	Lewis.....	1,000	1	90	14 00	Very favorable.....	400
310.....	Tompkins.....	2,250	1	80	38 00	Very favorable.....	1,000
311.....	Franklin.....	2,000	2	83	11 00	Imperative.....	10,000
312.....	Onondaga.....	2,000	3	98	12 00	Investment.....	2,000
313.....	Monroe.....	1,500	1 ½	66	6 00	Dissatisfied.....	500
314.....	Queens.....	1,000	1	20	.....	Favorable.....	.....
315.....	Delaware.....	1,000	1	80	6 00	Advisable.....	.....
316.....	Otsego.....	3,000	2 ½	93	30 29	Very good.....	5,000
317.....	Oswego.....	3,500	2	75	10 00	Very beneficial.....	.....
318.....	(Canceled.)	.....	.....	.....	.....	.....	.....
319.....	Franklin.....	8,000	10	90	10 00	Practical — profitable.....	Many hundred
320.....	Hamilton.....	3,000	2	97	22 00	Good.....	3,000
321.....	Cayuga.....	1,000	1 ½	90	9 00	Excellent.....	.....
322.....	Warren.....	2,000	1	87 ½	.....	Favorable.....	.....
323.....	Albany.....	1,000	1	98	.....	Very favorable.....	.....
324.....	Saratoga.....	5,000	4	80	8 00	Beneficial.....	One-fourth of town
325.....	Fulton.....	5,000	4	80	8 00	Desirable.....	250
326.....	Otsego.....	1,000	1	83	3 00	Necessary.....	.....
327.....	Erie.....	1,000	1	93	.....	.....	.....
328.....	Saratoga.....	30,000	30	.....	.....	.....	.....
329.....	(Canceled.)	.....	.....	.....	.....	.....	.....
330.....	Monroe.....	3,000	3	90	10 00	Excellent.....	500
331.....	Oneida.....	8,500	7	80	.....	Good.....	.....
332.....	Westchester.....	1,000	1	.....	.....	Very favorable.....	4,000
333.....	Fulton.....	22,000	20	95	10 00	.....	.....
334.....	Oneida.....	1,300	1	.....	10 00	Very valuable.....	500
335.....	Allegany.....	1,200	1	75	.....	Very good.....	Several thousand
336.....	Monroe.....	3,000	3	90	8 00	Advisable.....	Hundreds
337.....	Oswego.....	2,000	3	75	12 00	.....	.....
338.....	Albany.....	2,000	2 ½	80	10 00	Necessary.....	Many
339.....	(Canceled.)	.....	.....	.....	.....	.....	.....
340.....	Oneida.....	1,000	1	97	11 00	Good.....	1,000
341.....	(Canceled.)	.....	.....	.....	.....	Investment.....	400
342.....	Delaware.....	1,000	1	90	10 00	Necessary.....	10,000
343.....	Ontario.....	2,000	1	100	5 70	.....	.....
344.....	St. Lawrence.....	3,000	3	.....	.....	Excellent.....	One-half of town
345.....	Essex.....	3,000	.....	92	5 00	.....	.....
346.....	Cattaraugus.....	1,000	.....	.....	.....	.....	.....
347.....	Madison.....	2,000	2	.....	.....	.....	.....
348.....	(Canceled.)	.....	.....	.....	.....	.....	.....
349.....	Rensselaer.....	1,000	1	.....	.....	.....	.....
350.....	Chautauqua.....	300	.....	.....	.....	.....	.....
351.....	Essex.....	15,000	12	.....	11 25	Very favorable.....	.....
352.....	Schenectady.....	1,000	.....	93	9 00	Favorable.....	.....
353.....	Albany.....	1,000	1	100	12 00	Very favorable.....	4,000
354.....	Wassau.....	1,500	1 ½	75	24 00	Advisable.....	Many
355.....	Westchester.....	2,500	2	60	.....	.....	.....

SUMMARY OF 1910 — TREE DISTRIBUTION — (Continued)

Application number	COUNTY WHERE PLANTED	Total trees planted	Acres planted	Per cent living	Cost of planting per acre including trees	Opinion of reforestation	Estimated acreage in town that ought to be planted
356.....	Delaware.....	2,000	1 1/4	95	\$18 50	Investment.....	1,000
357.....	Westchester.....	1,000	1	90	.....	.....	.....
358.....	Fulton.....	10,000	8	.....	.....	.....	.....
359.....	Warren.....	6,500	5	90	.....	Very good.....	15,000
360.....	St. Lawrence.....	1,000	3	80	4 33	Excellent.....	5,000
361.....	Saratoga.....	3,500	3	90	9 00	Necessary.....	5,000
362.....	(Canceled.)						
363.....	Cattaraugus.....	1,000	1	90	17 00	Very important.....	.....
364.....	Oneida.....	3,000	2 1/4	95	7 50	Excellent.....	5,000
365.....	Warren.....	15,000	11 1/4	60	.....	Good.....	.....
366.....	Allegany.....	1,000	1	90	10 00	Investment.....	10 per cent of t'wn
367.....	Essex.....	2,500	2	.....	9 00	.....	10,000
368.....	Westchester.....	1,000	1	60	.....	Excellent.....	3,500
369.....	Oneida.....	1,000	1	98	8 00	Very good.....	500
370.....	St. Lawrence.....	1,000	1	90	10 00	Good.....	800
371.....	Otsego.....	1,000	1	80	16 40	Very good.....	Many
372.....	(Canceled.)						
373.....	Lewis.....	2,000	1 1/4	90	12 00	Very good.....	1,000-2,000
374.....	Jefferson.....	2,000	1 1/4	50	16 00	Investment.....	2,000
375.....	Albany.....	4,000	5	33	5 00	Very favorable.....	.....
376.....	Cattaraugus.....	1,000	1	90	14 00	Very good.....	Many
377.....	Chemung.....	6,500	4	95	22 50	Very favorable.....	1,000
378.....	Lewis.....	1,000	2	92	9 00	Necessary.....	Many
379.....	Lewis.....	1,000	1	75	.....	Good.....	4,000-5,000
380.....	Herkimer.....	5,000	5	96	7 50	Very good.....	.....
381.....	Nassau.....	16,500	15	93	.....	Necessary.....	.....
382.....	Cattaraugus.....	1,000	20	90	.....	Very good.....	.....
383.....	Oneida.....	1,500	1 1/4	93	8 00	.....	Many
384.....	(Canceled.)						
385.....	Ulster.....	26,000	22	98	10 00	Necessary.....	1,000
386.....	St. Lawrence.....	10,000	10	75	10 00	Investment.....	Two-thirds of t'wn
387.....	Oneida.....	3,000	3	100	.....	Necessary.....	.....
388.....	Chemung.....	750	3/4	50	.....	Necessary.....	.....
389.....	Chemung.....	500	.....	75	.....	Good.....	One-fourth of t'wn
390.....	Warren.....	2,000	1 1/4	90	10 00	Good.....	.....
391.....	Herkimer.....	2,000	2	90	8 00	Very favorable.....	Many hundreds



Photo by R. E. Gooding.
First Seed Beds Patnode Nursery, Lake Clear Junction.



Photo by R. E. Gooding.
Second Year Seed Beds Patnode Nursery, Lake Clear Junction. (There are in this nursery of approximately two acres over five million seedling trees.)

Herkimer.....	302	10,500	12	88	Very good.	Several thousand	10,000
Washington.....	303	3,500	34	60	Necessary.	7,000	5,000
Delaware.....	304	3,500	10	95	Good.	2,500	Many
Pulton.....	305	2,500	2	84	Good.	.....	.....
Franklin.....	306	6,500	.....	75	.....	.....	.....
Nassau.....	307	6,500	2	90	Valuable	.....	.....
Delaware.....	308	7,000	0	.....	Beneficial	.....	.....
Delaware.....	309	5,000	.....	12	Fine	.....	.....
Saratoga.....	310	5,000	4	98	.....	.....	.....
(Canceled).....	401	2,000	14	98	Excellent.	Several thousand	.....
Lewis.....	402	12,000	10	85	.....	.....	.....
Schoharie.....	403	1,000	1	80	Favorable	500	.....
Otsego.....	404	4,000	1	90	Necessary	500	.....
Nassau.....	405	2,000	2	.....	.....	.....	.....
(Canceled).....	406	.....	3	.....	.....	.....	.....
Warren.....	407	7,000	22	88	Very favorable.	Many	.....
St. Lawrence.....	408	3,000	4	75	Favorable.	.....	.....
Saratoga.....	409	2,000	2	50	Very favorable.	24 square miles	.....
Warren.....	410	500	3	.....	.....	Several hundred	.....
Seneca.....	411	2,000	3	92	Desirable	.....	.....
Oneida.....	412	5,500	5	94	Practical	.....	.....
Fulton.....	413	1,000	1	75	Excellent	Many	.....
Franklin.....	414	40,000	35	95	Favorable	One-sixth of town.	.....
Chenango.....	415	11,000	12	86	Favorable	.....	.....
Madison.....	416	7,000	1	80	Excellent	1,000	.....
St. Lawrence.....	417	1,000	3	100	.....	3,000	.....
Lewis.....	418	1,000	1	90	Excellent	Hundreds	.....
Warren.....	419	13,000	84	96	Good	.....	.....
Otsego.....	420	4,500	5	90	Good	1,000	.....
Albany.....	421	3,000	.....	17	Favorable	.....	.....
Livingston.....	422	1,000	66	11	Favorable	.....	.....
Delaware.....	423	1,000	80	10	Excellent	Thousands	.....
Columbia.....	424	3,500	.....	90	Very good.	Thousands	.....
Herkimer.....	425	1,000	.....	18	Good	250	.....
Ulster.....	426	2,000	1	95	Good	.....	.....
Hamilton.....	427	1,500	2	.....	Good	.....	.....
Greene.....	428	2,000	2	40	Excellent	.....	.....
Clinton.....	429	1,000	14	15	Very favorable.	.....	.....
Livingston.....	430	1,000	1	95	Favorable	2,000	.....
(Canceled).....	431	11,000	10	80	Very favorable.	.....	.....
Chenango.....	432	6,500	8	71	Very favorable.	Many	.....
Chemung.....	433	1,000	1	70	Good	3,000	.....
Delaware.....	434	2,000	2	55	Profitable	Many	.....
Essex.....	435	3,500	3	95	Good	10 per cent of town	.....
Broome.....	436	1,500	85	90	Highly desirable	4,000	.....
Franklin.....	437	75,000	60	90	Favorable	25,000	.....

SUMMARY OF 1910—TREE DISTRIBUTION—(Concluded)

Application number	COUNTY WHERE PLANTED	Total trees planted	Acres planted	Per cent living	Cost of planting per acre including trees	Opinion of reforesting	Estimated acreage in town that ought to be planted
438.....	St. Lawrence.....	3,000	34	95	\$10 00	Good.....	Thousands
439.....	Clinton.....	10,000	8	.....	.....	.....	One-half of town
440.....	Steuben.....	1,000	3	50	24 00	Favorable.....	10 per cent of t'wn
441.....	Tompkins.....	1,500	14	50	8 00	Very desirable.....	500-1,000
442.....	Wayne.....	2,500	24	60	16 00	Investment.....	.....
443.....	Fulton.....	2,500	24	.....	.....	.....	.....
444.....	Schenectady.....	1,000	1	30	11 00	.....	.....
445.....	Clinton.....	4,000	34	95	15 00	Excellent.....	1,000
446.....	Steuben.....	1,500	14	90	25 00	Too expensive.....	Thousands
447.....	Warren.....	6,700	6	96	26 00	Favorable.....	.....
448.....	(Canceled.)	.....	.....	.....	.....	.....	.....
449.....	Nassau.....	2,000	2	80	.....	.....	1,000
450.....	Essex.....	1,000	1	.....	.....	.....	.....
451.....	Oneida.....	6,000	5	100	11 00	Good.....	.....
452.....	Delaware.....	1,500	1 1/4	95	5 00	Desirable.....	1,000
453.....	Onondaga.....	6,500	58	95	9 82	Favorable.....	20 per cent of t'wn
454.....	Dutchess.....	1,000	1	.....	.....	.....	.....
455.....	Allegany.....	1,000	1	60	10 00	Favorable.....	.....
456.....	Orsego.....	3,500	3	88	30 00	Desirable.....	Many
457.....	Essex.....	500	.....	98	.....	Good.....	.....
458.....	Lewis.....	2,000	2	45	9 60	.....	.....
459.....	Saratoga.....	3,000	5	95	5 40	Important.....	25 per cent of t'wn
460.....	Saratoga.....	6,000	6	66	7 50	Necessary.....	8,000
461.....	Rockland.....	3,000	2	.....	.....	Favorable.....	5,000
462.....	Monroe.....	7,500	6	74	6 25	Desirable.....	.....
463.....	Oneida.....	5,500	8	75	14 00	Very favorable.....	Hundreds
464.....	(Canceled.)	.....	.....	.....	.....	.....	.....
465.....	Nassau.....	2,500	1	80	4 00	Excellent.....	.....
466.....	Jefferson.....	3,000	34	90	7 50	Favorable.....	10 per cent of t'wn
467.....	St. Lawrence.....	1,000	1	95	7 50	Excellent.....	1,000
468.....	Albany.....	1,000	1	75	.....	Good.....	.....
469.....	Oneida.....	52,000	50	98	10 00	.....	.....
470.....	Jefferson.....	1,000	1	95	12 00	Necessary.....	1,000
471.....	Westchester.....	2,000	2	95	.....	Investment.....	Very many
472.....	Sullivan.....	6,000	7	75	7 00	Most advisable.....	.....



Photo by R. E. Gooding.
 Portion of Lake Clear Nursery, Lake Clear Junction, N. Y.



Photo by C. R. Pettis.
 Norway Spruce Seedlings Imported from Germany. Out of a shipment of
 500,000 trees less than 20,000 could be used.



Photo by F. J. Rogers.
 White Pine Transplant Two Years After Planting Showing Growth of Eleven Inches. This tree was planted under light shade.



Photo by F. J. Rogers.
 White Pine Transplant Same Age as Tree in Adjacent Picture, but Planted in the Open.

Oswego.....	1,000	1,000	6,500	.....	.....	500	2,200	.....	.....	.....	5,200	Silver	32,800
Otsego.....	3,000	9,000	5,500	.....	.....	4,500	18,000	.....	.....	.....	10,500	Fr 400	66,000
Putnam.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	European	.....
Queens.....	200	.....	600	.....	.....	.....	.....	.....	.....	.....	200	Larch	.....
Rensselaer.....	500	7,000	1,500	.....	.....	.....	.....	.....	.....	.....	.....	15,000	.....
Richmond.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Tulip 1,000	1,000
Rockland.....	1,000	2,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10,000
St. Lawrence.....	7,500	22,000	4,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Saratoga.....	3,000	90,500	10,500	3,000	1,000	1,500	2,000	1,000	1,000	1,000	2,000	.....	4,500
Schenectady.....	500	.....	.....	500	.....	.....	1,500	.....	.....	.....	.....	.....	108,500
Schoharie.....	500	.....	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,000
Schuyler.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,000
Seneca.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Steuben.....	1,000	.....	.....	.....	.....	1,000	1,500	1,000	1,000	1,000	3,000	.....	2,000
Suffolk.....	500	.....	.....	.....	.....	.....	1,000	1,000	1,000	1,000	3,500	.....	8,000
Sullivan.....	500	4,000	2,000	1,000	.....	.....	9,000	.....	.....	.....	.....	Sugar	2,500
Tioga.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Pine 325	16,950
Tompkins.....	1,300	1,050	300	50	.....	.....	1,500	.....	.....	.....	.....	Jeffry	.....
Ulster.....	500	27,000	.....	.....	.....	.....	3,800	.....	.....	.....	.....	Pine 125	.....
Warren.....	14,510	72,500	30,910	6,000	.....	.....	39,010	100	.....	.....	.....	.....	4,750
Washington.....	500	1,000	.....	.....	.....	.....	1,200	.....	.....	.....	.....	.....	33,500
Wayne.....	500	2,000	.....	.....	.....	.....	3,000	.....	.....	.....	.....	.....	165,150
Westchester.....	4,100	6,000	8,100	500	.....	.....	11,500	.....	.....	.....	.....	.....	5,000
Wyoming.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,500
Yates.....	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	43,700
Grand totals.....	114,810	486,450	261,835	38,950	40,835	133,860	489,010	27,600	33,350	2,800	52,650	17,850	1,700,000

THE BLISTER RUST

In the spring of 1908, following the former custom, a large quantity of two year old white pine seedlings were imported from Germany and 350,000 were set in a nursery at Lake Clear Junction. It was the expectation that they would be available for distribution this year, but unfortunately it was found that they were affected with the white pine blister rust,* a very serious disease of white pine abroad, and after several inspections by expert pathologists and most careful consideration of the entire matter, they were all condemned by the Commissioner of Agriculture and consequently burned. At a time when planting stock was in such demand this seemed like a serious loss but it was the only proper course to pursue. The value of white pine and its importance as a lumber tree is so great we cannot afford to do anything to imperil its future. The cost of these trees is nothing in comparison with the damage the disease might cause. The wisdom of that course has been illustrated the past summer by some white pine in a plantation near Lake Clear Junction. There is in this plantation a quantity of white pine planted in 1902, when four years old, which has made a promising growth until the past two summers. Last year some of the trees had yellow tips also a decided thickening and softening of the bark, and trees that had made a height growth of two feet and more in previous years, ceased to grow and indicated signs of disease. Specimens were submitted to the State Botanist, State Entomologist and the United States Bureau of Plant Industry and their assistance requested. It was evident that the trouble was not due to insects and the pathologists could not give us definite information. The trees continued to assume a more decided yellow coloring in the leaves and manifested other indications of disease. This disease being new in this country the experts could not identify it because they had not had experience with its various forms and characteristics. In November an examination by the Assistant State Botanist, of another plantation con-

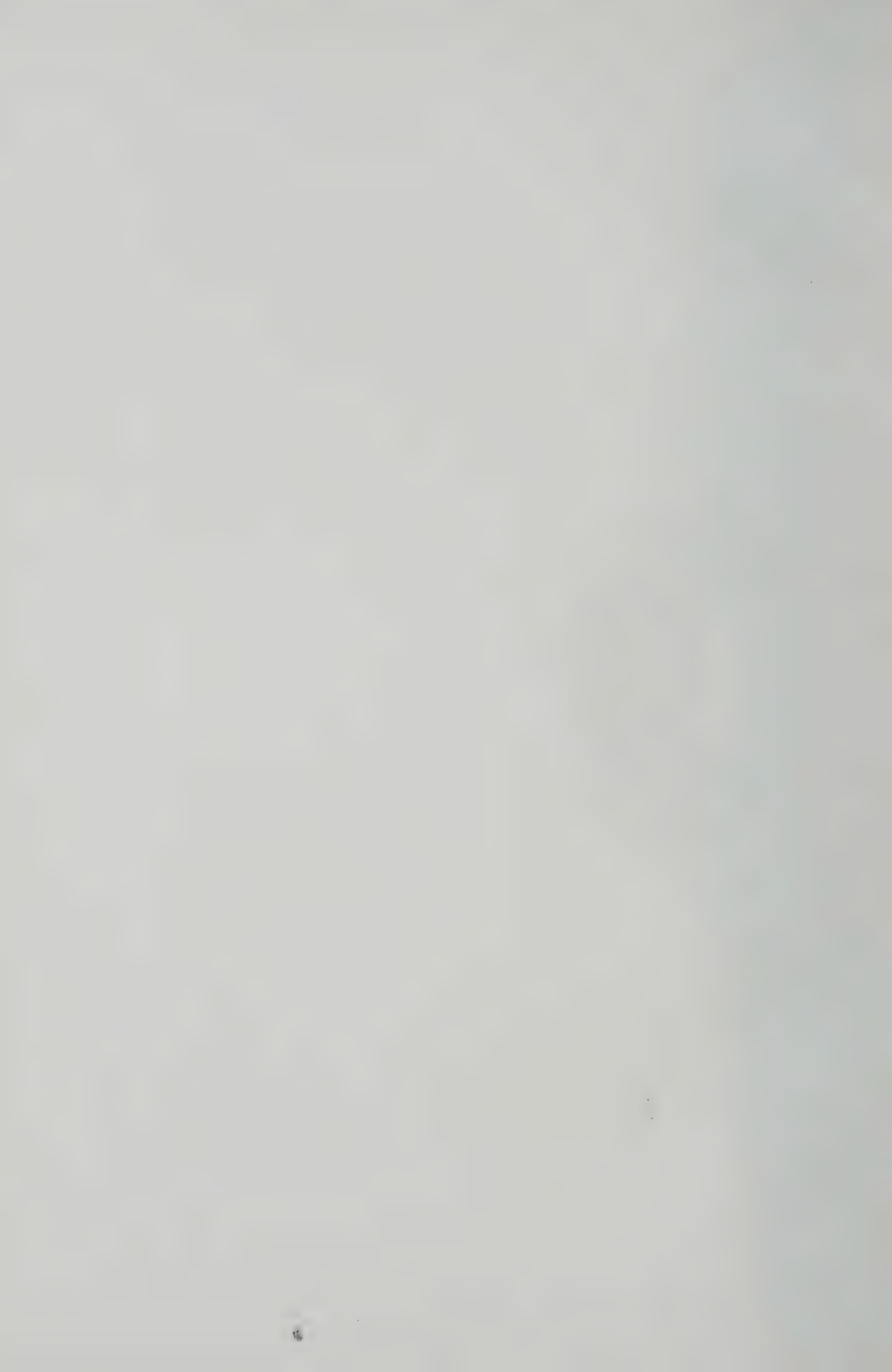
* This disease was fully described in our 1909 report also in Horticultural Bulletin No. 2, State Department of Agriculture, Albany, and Circular 38, Bureau of Plant Industry, Washington, D. C.



Photo by R. E. Gooding.
Portion of Saranac Inn Nursery.



Photo by J. W. Stephen.
Portion of Salamanca Nursery.



sisting of German white pine, developed the fact that the Lake Clear trees are affected with the blister rust. This fact was ascertained by discovering intervening stages of the disease together with swellings containing immature forms which he was able to recognize, thereby enabling him to connect the various stages of the disease. There are but a few acres of white pine in this plantation and all should be destroyed before spring when the spores mature.

The fact that this disease has been imported into this and other States is regrettable, but through the excellent assistance of the State Department of Agriculture, we hope and believe that it can be prevented from becoming established in this State. It was imported with the foreign seedlings and they were purchased at a time when it was impossible to secure white pine seedlings in quantity in this country, except at a prohibitive price. This and other diseases of a similar nature were then almost unknown in this country at the time the trees were imported. New York was the first to discover its presence and has taken the most aggressive means to check it.

A similar situation exists now in regard to the stock in the Salamanca Nursery as occurred at the Lake Clear Nursery last spring. There are in this nursery 615,000 four-year-old white pine transplants which were imported in the spring of 1909 when the disease was discovered. At least a part of them are known to be affected with this disease and they should all be burned. Fortunately the disease was discovered before the account from the German Nurseryman was audited and it has never been paid.

The several plantations throughout the State, where any German white pines have been planted, were all carefully inspected either by this Department or the State Department of Agriculture during the month of May. There were found 484 pines with spore bodies; 1,174 trees with abnormal swellings and 6,151 ribes plants all of which were destroyed. A problem is presented in regard to these plantations on private lands made with these German pines that must be seriously considered promptly.

The people of this country ought to exercise the greatest care in the purchase of stock and seeds for reforestation work. If they expect success they must not try to see how cheap the work can be done but measure the cost by results secured. Planting stock can be purchased abroad much cheaper than here because labor there costs less, but when duty, freight, packing, loss of trees through exposure and long transit, chance of disease, and all the attending inconveniences are considered, the American grown stock is much cheaper. In case any owner desires to sow or plant tree seeds he should ask the dealer for seed samples, and make him guarantee that shipment will be equal in quality to samples sent.

NURSERY METHODS

The nursery methods have been continued the same as last year, except that the "Yale Planting Board" has been used with great success in transplanting work and has been the means of saving several hundred dollars. This board was invented by Prof. J. W. Toumey of the Yale Forest School and consists of two strips of wood joined by hinged arms fastened to the strips at right angles in order that they will open and close. One strip is notched and the notches are the distance apart that the trees are to be set in the transplant row (in our work three inches) while the other is plain and when a tree has been placed in each notch of the former the latter strip closes over and holds the seedlings in place while they are planted. The men work five in a crew, *i. e.*, two threading the trees into the notches, two making and filling the trench, while the fifth carries the board. While two are threading the board, two others are making a trench into which the fifth man places the planting board at such a height that the seedlings will be at their proper depth, then the soil is firmly packed. The fastener on the board is then released and the board removed ready for refilling. The particular advantages of this board are that the men do not become fatigued from constant work on their knees as has been the case when transplanting with trowels; the roots secure a natural position and are never doubled or bent; the planting is done much more rapidly and at less expense, also



Photo by C. R. Pettis.

Transplanting with Yale Planting Board.

the work can be carried on under more adverse weather conditions because no one need remain on the ground and at least three of the five men may wear gloves while working. The latter is particularly advantageous to us in the Adirondack work where we have so much unfavorable weather during the planting season.

INVENTORY OF NURSERY STOCK

An inventory of our nurseries shows the following stock on hand:

Lake Clear Nursery:

White pine transplants, 3 yrs. (2 1) large	108,000
White pine transplants, 3 yrs. (2 1) medium.....	600,000
White pine transplants, 2 yrs. (1 1) large	61,250
Red pine transplants, 3 yrs. (2 1) large.....	22,500
Red pine transplants, 2 yrs. (1 1) large.....	39,500
Scotch pine transplants, 3 yrs. (2 1) large.....	14,000
Scotch pine transplants, 2 yrs. (1 1) large.....	166,900
Bull pine transplants, 3 yrs. (2 1) large.....	14,000
Bull pine transplants, 2 yrs. (1 1) large.....	55,000
Jack pine transplants, 2 yrs. (1 1) large.....	48,000
Red spruce transplants, 4 yrs. (2 2) medium.....	47,000
European larch transplants, 2 yrs. (1 1) large.....	16,900
Total	1,193,050

Saranac Inn Nursery:

White pine transplants, 3 yrs. (2 1) large.....	263,200
White pine transplants, 2 yrs. (1 1) large.....	254,000
White pine seedlings, 1 yr., estimated.....	182,000
Scotch pine seedlings, 1 yr., estimated.....	60,000
Total	759,200

Forest Experiment Station:

White pine transplants, 3 yrs. (1 2).....	43,800
Scotch pine transplants, 3 yrs. (1 2).....	25,600

Red pine transplants, 3 yrs. (1 2).....	16,800
Norway spruce transplants, 4 yrs. (2 2).....	16,500
White spruce transplants 4 yrs. (2 2).....	12,300
White pine seedlings, 1 yr., estimated.....	255,000
Scotch pine seedlings, 1 yr., estimated.....	60,000
Total	430,000

Salamanca Nursery:

White pine transplants, 4 yrs. (2 2).....	615,000
Scotch pine transplants 4 yrs. (2 2).....	30,000
White pine seedlings, 2 yrs., estimated.....	1,600,000
Scotch pine seedlings, 2 yrs., estimated.....	600,000
Norway spruce seedlings, 2 yrs., estimated.....	50,000
European larch seedlings, 2 yrs., estimated.....	15,000
White pine seedlings, 1 yr., estimated.....	1,600,000
Scotch pine seedlings, 1 yr., estimated.....	500,000
Austrian pine seedlings, 1 yr., estimated.....	75,000
Norway spruce seedlings, 1 yr., estimated.....	90,000
European larch seedlings, 1 yr., estimated.....	20,000
Black locust seedlings, 1 yr., estimated.....	23,000
Box elder seedlings, 1 yr., estimated.....	6,000
White ash seedlings, 1 yr., estimated.....	700
Tulip seedlings, 1 yr., estimated.....	3,000
Carolina poplar, 1 yr., estimated.....	16,000
Total	5,243,700

Patnode Nursery:

White pine seedlings, 2 yrs., estimated.....	1,240,000
Scotch pine seedlings, 2 yrs., estimated.....	649,000
Red pine seedlings, 2 yrs., estimated.....	36,000
Norway spruce seedlings, 2 yrs., estimated.....	100,000
White spruce seedlings, 2 yrs., estimated.....	14,000
European larch seedlings, 2 yrs., estimated.....	18,000
White pine seedlings, 1 yr., estimated..	1,284,000

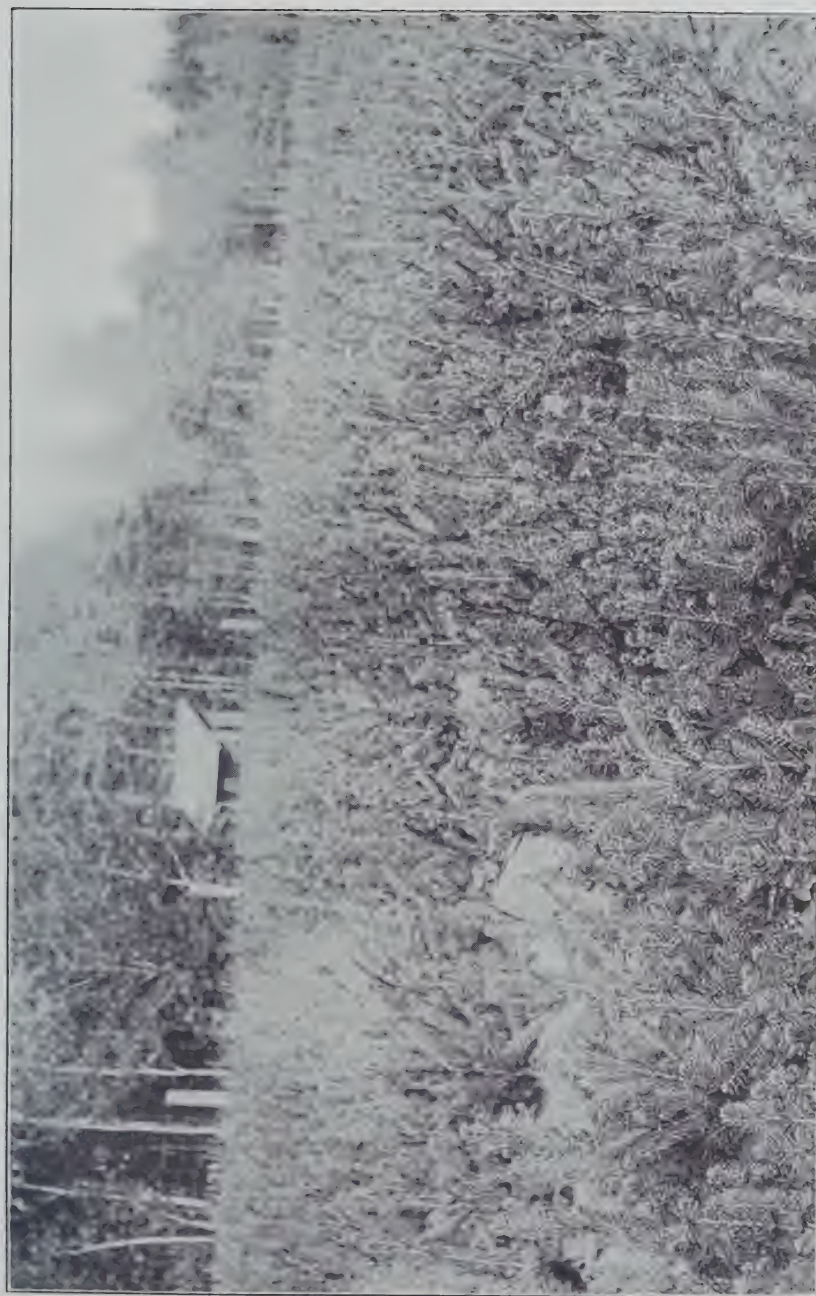
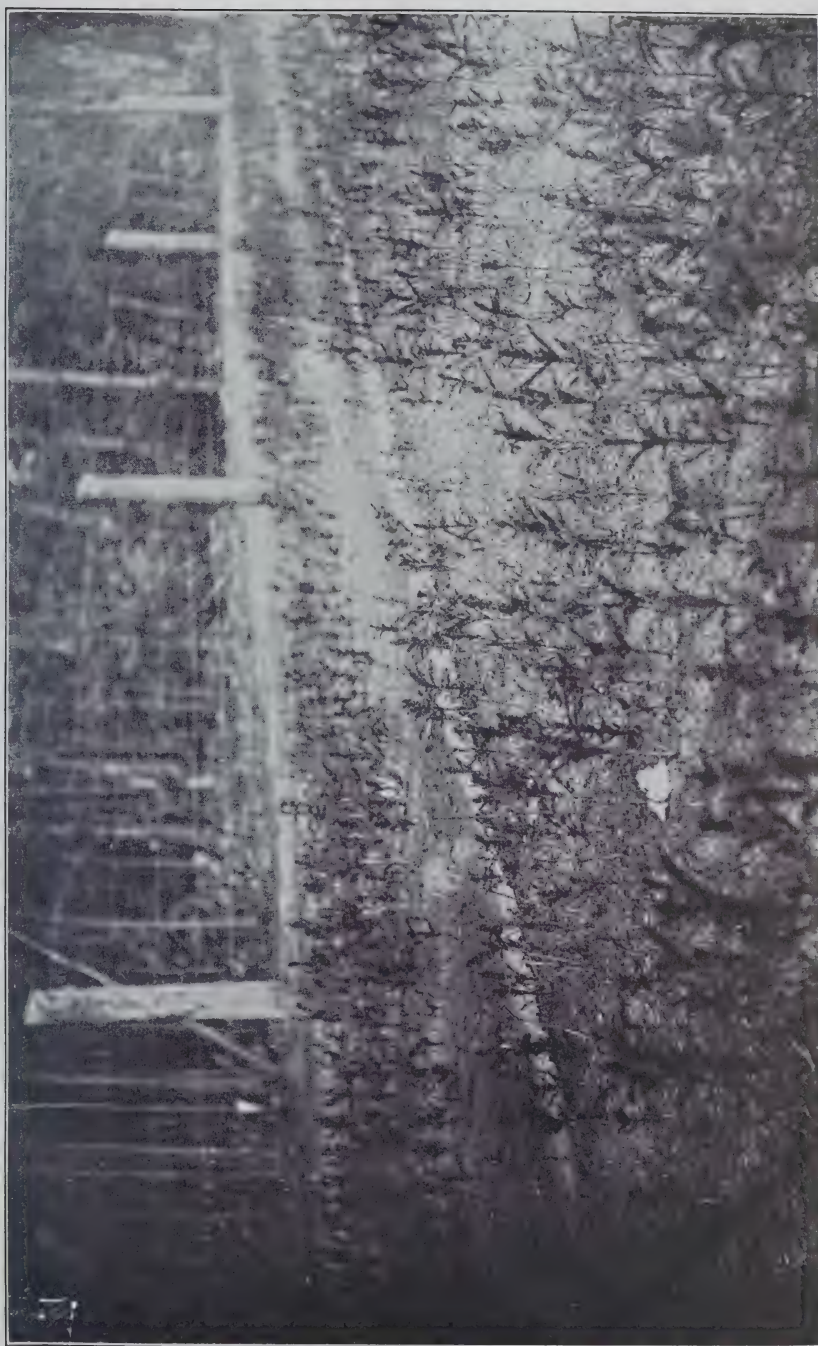


Photo by R. E. Gooding.

Norway Spruce Transplants Grown from Seed at Saranac Nursery.



Imported Norway Spruce Transplants. (Note large loss and poor condition of stock.)

Photo R. E. Gooding.

Scotch pine seedlings, 1 yr., estimated.....	368,000
Austrian pine seedlings, 1 yr., estimated.....	72,000
Norway spruce seedlings, 1 yr., estimated.....	312,000
European larch seedlings, 1 yr., estimated.....	45,000
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Total	4,138,000
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Grand total in nurseries December 1, 1910.....	11,763,900
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TRESPASS

During the year there have been reported to this office 122 cases of trespass on State land. It was found upon careful investigation that some of them had been previously reported, and in a few cases, after a survey had been made, it was ascertained that no trespass had been committed. A large number of them were of a petty nature and for fire wood.

The field force has been particularly active in looking after and protecting the State lands. A large number of the trespasses reported this year have been committed in former years. Later in this report, under the heading of State Forest Preserve, more will be said about this subject.

STATE FOREST PROBLEMS

The land owners of this State realize that the time is already at hand when they should give careful consideration to the management of their forest property. This office is constantly receiving requests for information, both from small and large owners, asking how to properly handle their holdings. It is the duty of this Commission to assist these parties, inasmuch as it is charged with the supervision of the forestry interests of the State,* and required to "prepare and distribute tracts giving information on the care and renewal of private woodlands." †

In order to satisfactorily undertake and pursue this work we require definite field studies showing the rate of growth of various

*Section 4, chapter 24, of the Laws of 1909.

†Section 40, chapter 24, of the Laws of 1909

species and the most desirable method of reproduction to be followed under different conditions; a study of present and possible utilization; of the fire danger and how it can be reduced; of the question of taxation of forest lands; and finally a better knowledge of the present forest conditions together with facts relative to what the owners demand as a basis of forest management. In order to begin this work an appropriation of at least \$5,000 should be available. A beginning has already been made and the forest surveys of two counties, Warren and Oneida, are published as an appendix to this report. The lack of time and money prohibited the growth studies which are necessary.

PRIVATE FORESTRY

Private forestry is of the greatest importance. The State can never expect to acquire large forest holdings outside of the Adirondacks and Catskills, and, therefore, the remaining forests of the State must be held, either by individuals, corporations or municipalities. It is not the duty of the State to handle these properties for them but it is its duty to assist these people in making a beginning and direct their honest efforts. Our citizens are ready to begin the work as soon as they can be advised how to proceed. In a State like New York with its irregular topography, forests as a protector to watersheds are a necessity in all sections. The work once successfully started in a locality, the idea of forest management will immediately appeal to all forest owners.

It has been recently stated * that the city of New York alone daily consumes 3,500 acres of forest for print paper. These figures would be greatly increased if the calculation was to apply to all the papers in the State and to it added the quantity used for lumber, poles, posts, fuel, etc. These figures strikingly indicate that forest management is a necessity and must be applied to our forest properties in order to insure a future supply.

The great clearing and lumbering processes assisted by forest fires have already removed our sources of supply a long distance

* Paper Trade Journal.

from the points of utilization and the economical limit will soon be reached. The expense of transporting the material long distances increases price and thereby insures a ready market for all the wood crops that can be produced at home, and furthermore the increase in population will result in higher prices for the material produced.

THE WOOD LOT

The small holder is much interested in the small forest often called the "wood lot." The combined acreage of these "wood lots" in this State is very great and has been estimated at 2,267,932 acres. These lots deserve the most careful attention, care and study, not only on account of their aggregate quantity but because throughout a large part of the State they are practically the only existing source of wood material or forest protection.

These facts have been presented generally throughout the State by illustrated lectures, but the more important part, the practical application, is yet to be done. We need first, sufficient data secured by field studies upon which to base recommendations. Second, diffusion of this information broadcast over the State. Third, practical application of various kinds of forest management in a large number of localities.

HUDSON HIGHLANDS RESERVATION

The Legislature of 1909 passed an act* creating the Highlands of the Hudson Reservation. During the year 1909 a careful forest survey of this tract was made and this, together with other facts in regard to this locality, was published in our annual report for that year. Almost one year after the passage of the act creating the Highlands of the Hudson Reservation, chapter 360 of the Laws of 1910, repealing the former act, was signed by the Governor, and chapter 361 approved by the Governor the same day, placed the jurisdiction of this property under the Palisades Interstate Park Commission.

* Chapter 463, of the Laws of 1909.

TREE DISEASES

The subject of diseases of forest trees is most important and on account of the increased interest in forestry has attracted much attention. The white pine blister rust was fully discussed in the annual report for 1909, also in this volume, under the head of re-foresting. The chestnut blight is gradually extending over more territory. The abnormal brown coloring of large numbers of balsam leaves throughout the Adirondacks attracted much attention and was investigated by Forester Howard, a digest from whose report follows:

"I examined the affected balsam on a lot in the town of Lewis, Essex county on April 29th, in order to investigate this disease. It was only possible to determine the grosser aspects of the disease in the field, therefore, numerous specimens illustrating the progress of the disease were forwarded to Albany. The disease was so common in that locality that approximately two-thirds of the trees were affected. A striking feature of the case was that a large number of the leaders and tips of the lateral branches had been cut off. It is uncertain what agency created this damage, as no evidence of any insect or animal could be found that could account for it, and it is most likely that the loss of twigs has no connection with the disease.

"The trees and parts of trees attacked by the fungus disease are readily distinguishable by the brilliant red color of the diseased portions. Some trees have been entirely killed; others are dead in their tops, while the lower parts of their crowns are still green and apparently healthy; still others have occasional branches diseased. Trees of the last class, however, are the exception rather than the rule. The evidence in this matter leads us to believe that the disease normally works down from the top of the tree.

"The bark on the branches affected, and on the trunk where it is attacked, is brownish red in color and is covered in many places with the fruiting bodies of the fungus which causes the trouble. The line of demarcation between the live bark and the dead bark is clear cut and distinct. The fruiting bodies of the fungus pro-

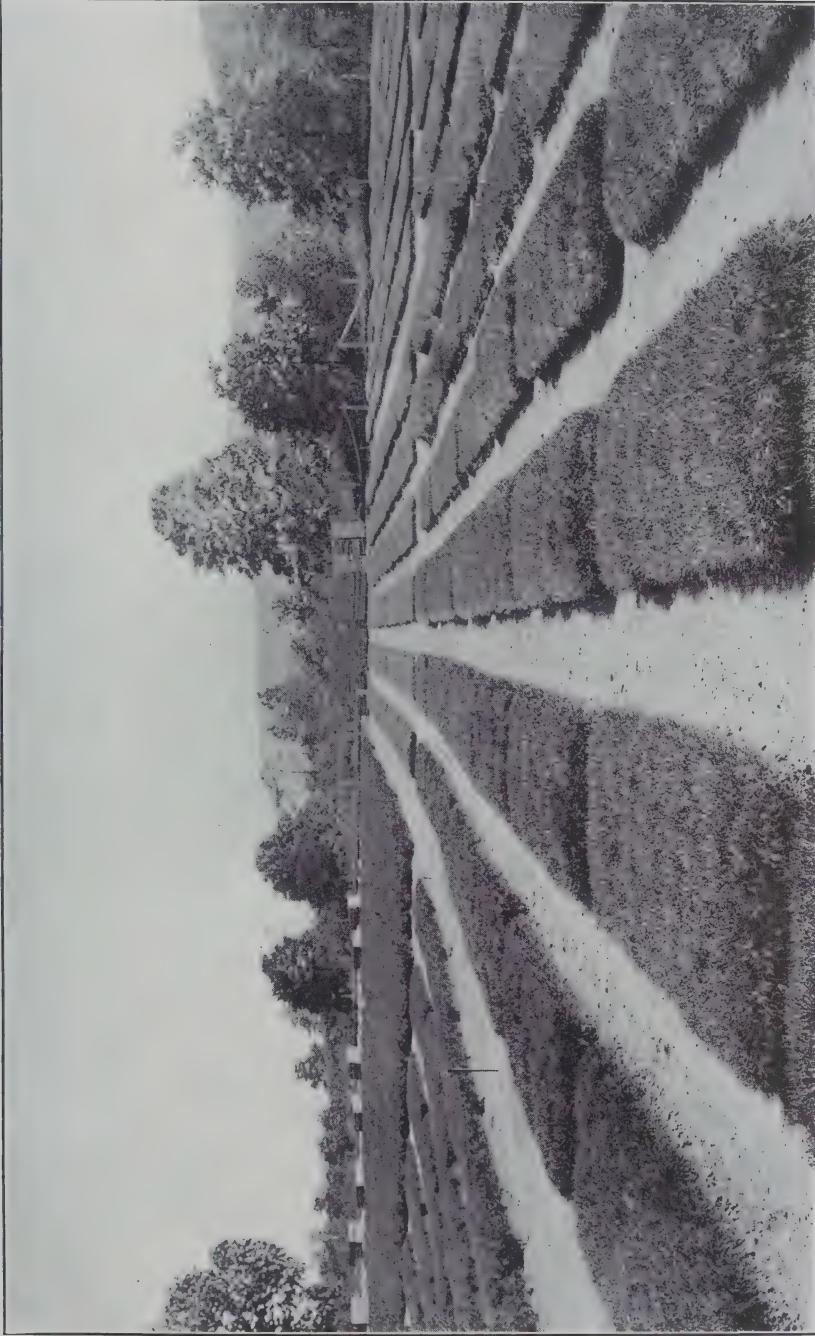


Photo by J. W. Stepien.

Two Year Old Seed Beds, Salamanca Nursery.

ject from the bark in little nodules. When the fungus spores have fully developed the nodules or sporophores are about one-sixteenth ($\frac{1}{16}$) of an inch in diameter and project from the bark about one-sixteenth ($\frac{1}{16}$) of an inch. They are white or yellowish in color, and may be readily seen with the naked eye. Specimens of parts of trees illustrating the nature of the disease were sent to the State Botanist, Dr. Charles H. Peck, and his report, which follows, diagnoses the fungus as a hitherto unknown species of *Cryptosporium*.

"These were the only balsams in the immediate vicinity; therefore, the danger of the disease spreading is reduced to a minimum. There seems to be no regular rule governing the distribution of the affected trees; they are scattered irregularly amongst the healthy trees.

"The lot is situated on a gentle easterly slope about fifteen hundred (1,500) feet elevation. The soil is a fairly rich sandy loam and is covered with a very thin layer of humus. The stand in which the balsams occur consists of the following species: Balsam (*Abies balsamea*), red spruce (*Picea rubens*), white pine (*Pinus strobus*), hemlock (*Tsuga canadensis*), hard maple (*Acer saccharum*), poplar (*Populus tremuloides*).

"The spruce on this lot is also diseased. The young seedlings, which are abundant in the openings between the larger trees, are especially noticeable because of their unhealthy appearance. Minute black spots are visible upon the dead leaves. This disease does not seem to attack a tree in a regular manner, but isolated branches may be affected, and oftentimes the leaves at the middle of a branch are affected while those at either end are apparently healthy. This is purely a leaf disease."

Report of Dr. Charles H. Peck, State Botanist:

"After having made a careful examination of the samples of partly dead trunk of balsam fir, *Abies balsamea*, and red spruce, *Picea rubra*, I find on the former a fungus development, the characters of which indicate that it is a species of *Cryptosporium*. The spores of this species are decidedly longer than in other species of the genus of which I find a description. I would, therefore,

call it for the present *Cryptosporium macrospermum* N. sp., in allusion to this character. They are fusiform, curved and generally terminate at each end in a very acute or subulate point, though sometimes one end is less sharply pointed than the other. The length of the spore is 60–80 mm. Its breadth in the widest part is 5–6 mm.

Inasmuch as I find the fungus threads or mycelium in the bark, both near to and remote from the pustules my impression is that the disease in the balsam fir at least is caused by the fungus. In the spruce I have not yet been able to find pustules of the fungus, nor even its mycelium in the dead bark. This casts a doubt upon the identity of the disease in the two trees, or upon the correctness of the theory that the fungus is the *cause* of the disease in the balsam.

Probably the quickest and most satisfactory way to settle the question would be by experiment. The inoculation of young and healthy trees both of balsam, fir and spruce with the spores of this fungus ought to show whether it is the cause of the disease or merely a consequence."

This disease has also been studied by Dr. Perley Spaulding of the Bureau of Plant Industry, U. S. Department of Agriculture, and various inoculations have been made, but no results yet obtained.

EDUCATIONAL WORK DONE

A large amount of educational work has been done the past year. The following publications have been issued and generally distributed:

Forestry Bulletin No. 2 — Reforesting.

Forestry Bulletin No. 3 — The Basket Willow.

Forestry Bulletin No. 5 — Outline for Lectures on Forestry.

Fifteenth Annual Report, 1909.

The Forest Fire Law and General Information Relative to Forest Fires.

Bulletins 1 and 4 have not yet been issued.

Forester Stephens has been engaged a portion of this winter lecturing on forestry, many of his addresses having been delivered

before local granges. He also accompanied the Demonstration Train under the direction of the State Department of Agriculture on one of its tours. We installed an exhibit of forestry work at the State Fair. This exhibit consisted of thirty-six large transparencies and a small sample forest plantation.

PROTECTION AGAINST FIRES

This State is the only northeastern State, except Maine, whose State Forest Department does not exercise some jurisdiction or look after forest fires generally throughout the State. The amendment to the Town Law, chapter 630, Laws of 1910, provides that the supervisor of the town shall have authority to prevent and extinguish forest fires, but experience has shown, not only in this State, but in other States, that there must be, in order to secure adequate protection, some power of supervision. The supervisors need instructions in regard to their duties and the people at large must be made to realize the consequences that follow continued and extensive fires. During the past years large areas have been burned and in some cases the supervisors have made little, if any, attempt to extinguish these fires. This department has been called upon many times this season and asked to see that the supervisors fully discharge their duties. Under the present Town Law this department is apparently without any authority outside of the towns enumerated in section 73 of the Forest Law, yet the Commissioner is charged with the "enforcement of the laws for the protection of fish and game and the forests,"* and "make rules for the prevention of forest fires and cause the same to be posted in all proper places throughout the State."† The experience in this State under the old fire warden system will be equally applicable in the case of the town supervisors. The old town warden system was never effective until a Chief Fire Warden was appointed, whose duty it was to visit these local wardens, instruct them in their duties, also ascertain if they were rendering efficient service, and securing proper fire protection. The large areas of

*Section 5, chap. 24, Laws of 1909.

†Section 40, chap. 24, Laws of 1909.

forests throughout the State need better protection, and satisfactory results cannot be secured until there is some central authority vested in this Commission to secure the necessary enforcement of the law.

THE FOREST PRESERVE

STATISTICS

The forest preserve consists of two parts, viz.: the Adirondack Preserve and the Catskill Preserve. The acquisition of lands for the two forest parks in these preserves is made by the Forest Purchasing Board. The acreage conveyed during the past year is much less than usual. A summary of holdings, conveyances and purchases, follows:

PRESERVE	Acreage December 31, 1909	Acreage acquired 1910	Acreage December 31, 1910	Acreage contracted awaiting conveyance	Total acreage owned and contracted
Adirondack.....	1,530,559	224	1,530,783	1,182.3	1,531,965.3
Catskill.....	110,964	1,256.76	112,220.76	16,530.06	128,750.82
Total.....	1,641,523	1,480.76	1,643,003.76	17,712.36	1,660,716.12

The administration of the State forest lands within these two preserves presents some problems. A computation shows that the outside boundary lines of the parcels aggregate a total of 9,146 miles of which 8,474 miles are in the Adirondack and 672 miles in the Catskill Preserve. Of these lines 3,747 miles are outside bounds of the State's property and only 809 miles of the entire 9,146 have been surveyed in the past five years. The surveying has all been done not with the idea of the systematic location of the State's property, but to determine from time to time in various places whether or not trespasses have been committed and determine their extent. There are many parcels of land claimed by the State, the location of which has never been determined and the area of which is only relatively known. There is probably no other property belonging to the State anywhere that has received less care than some of the State forest preserve land and the whole trouble is caused by lack of funds for necessary surveys. The appropriation for this purpose last year was \$5,000; while some lumber com-

panies and other land owners whose holdings are but a fraction of that of the State spend as much or more for this important work.

LOCATION OF STATE LANDS

The first and most important step in forest protection after that from fire is the correct location and marking of all the bounds of the property. The fact that lines of State's property are not marked or are marked incorrectly is no excuse for trespass upon State land, but at present it is by far the largest cause. The State lands will not be safe from trespass until the boundary lines are correctly located and conspicuously marked in order that our field force may easily and quickly detect any improper use, also that operators and others may know their location. The fact that nearly all the original surveys are one hundred or more years old, and the original monuments are rapidly disappearing, makes it most urgent that these surveys be commenced at once and pushed to completion as rapidly as possible. It is difficult to realize that the lines of the State's holdings aggregate nearly nine thousand miles and the difficulty experienced by any force, no matter how competent, in fully protecting the State's interest when the lines are often indistinctly marked.

The following bill was introduced in the Assembly by Mr. Shea last year but failed to pass. The necessity of such a law is apparent when any one understands the conditions, and it is hoped that it may be passed at the present session.

"Identification and establishment of boundaries and land marks in forest preserve counties. The forest, fish and game commissioner may cause surveys and investigations to be made in any county in which a part of the forest preserve is located for the purpose of identifying and establishing boundaries to public and private lands therein, locating the monuments and land marks indicating such boundaries, the perpetuation of testimony, field notes, maps, information and other data relating thereto, and the erection of such monuments and land marks as may be necessary to permanently locate, mark, identify and perpetuate such boundaries. For such purpose he may from time to time designate such civil

engineers and other persons as are necessary to perform such work and fix their compensation. The designation of such civil engineers shall be in writing and filed with the secretary of state, and each engineer so designated, before entering upon his duties, shall take and file the constitutional oath of office with the secretary of state. Every civil engineer so designated and qualifying may subpoena witnesses, administer oaths and take testimony in the form of affidavits or otherwise. Each civil engineer so designated and qualifying shall make and file with the forest, fish and game commissioner a report, which shall consist of the field work done by him or under his direction, as to the boundaries of each separate township or tract of land, and the distinct lots, therein so established, located and marked by him, and a map which shall correctly show the location and permanent marking of such boundaries upon the ground, and all testimony taken by him, and all field notes, maps, information and other data obtained by him in locating, establishing and marking such boundaries. The forest, fish and game commissioner shall file copies of such reports, certified by him, in the clerk's office of the county in which the townships or tracts of land mentioned in said reports are located. Upon filing such copies of such reports in the county clerk's office, the same shall become and be presumptive evidence that the boundaries of the township or tract, and the distinct lots therein, in said report named, have been and are regularly, properly, duly and legally located, established and permanently marked upon the ground, as shown by such report, and shall be conclusive evidence thereof from and after the expiration of one year from the date of filing such copy of each such report in such county clerk's office, unless an owner or other person interested in the lands comprised within or affected by the boundaries of the township or tract, or distinct lots therein, mentioned in such report, shall within one year from the date of the filing thereof in said county clerk's office and upon sixteen days' notice in writing to the forest, fish and game commissioner, apply to the supreme court of the judicial district in which such lands are situate, to have such report altered or modified, which court shall have power to take proof upon such application, and to affirm, alter or modify such report as the facts require, and such report shall thereupon become such conclusive evidence thereof from and after the expiration of one year from the date of the filing of the order of the court, affirming, altering or modifying such report. Every such report or copies thereof, certified by the commissioner or county clerk, shall be received in evidence in the trial of actions or proceedings in courts of justice."

OCCUPANCY AND BUILDINGS

There are, at present, various cases of occupancy of State land. In some instances the parties living on the land have a title which must be given fair consideration, while there are other cases of occupancy where the occupants have no rights or interests worthy of any consideration. An effort has been made recently to secure reliable first hand information in regard to these various cases and have it available when required.

An opinion was recently handed down by the Attorney-General, stating that buildings on State land could not be sold because selling such buildings would mean their removal and, therefore, the removal of wood from State land in violation of the statute defining a trespass. In order to reduce the occupancies, it will be desirable to remove or destroy the buildings. It would be far more desirable if the buildings could be sold to the best advantage, but in order to do so it will be necessary to amend sections 42 and 240, chapter 24 of the Laws of 1910.

USE OF FOREST TERRITORY

The fact that approximately 1,600,000 acres of land is withdrawn from any use except as a protective forest, has provoked much discussion. There are those who advocate leasing camp sites of limited size in certain localities; others desire the opening up of the great forest area by the construction of State roads; there are quantities of valuable timber and wood in the trees killed by the 1908 fires which many believe ought to be utilized; there is going to waste vast volumes of water aggregating thousands of horsepower which ardent advocates believe ought to be made to perform its intended service; there is also the practice of forestry upon this large area and the question of making an effort to both improve the growth and secure the annual increment which is of great economical importance. The time has come when the people of the State must carefully study these problems in all their phases and formulate opinions that a definite policy in regard to the use of this great forest property may be established.

MAPS PREPARED

The Legislature of 1909 authorized the preparation of a new map of the Catskill Forest, which has been prepared and is submitted with this report. The preparation of this map has entailed a large amount of work and this Department was most fortunate in securing the services of Mr. Edward B. Codwise, C.E., of Kingston, N. Y., a man of large experience in field work in that region, possessing an exceptional amount of knowledge of land patents, grants, tracts and lines, and an acknowledged authority in that section.

The supply of the Adirondack map has been exhausted and a revision has been made. This map also is submitted with this report.

Respectfully,

C. R. PETTIS,
Superintendent State Forests.

December 31, 1910.

APPENDIX
TO
REPORT OF SUPERINTENDENT OF FORESTS



FOREST CONDITIONS OF WARREN COUNTY

BY
F. FRANK MOON, M. F., State Forester

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FOREST CONDITIONS IN WARREN COUNTY

INTRODUCTION

Viewed from every side except that of agriculture, there is probably no county in the State of New York that possesses the natural resources that Warren county has. Its lakes and streams attract hundreds of tourists and sportsmen, bringing in many thousands of dollars annually; it has deposits of garnet and asbestos and one of the most valuable graphite mines in the world; and as a timber and pulp producing center it ranks very high.

Considering Warren county from the standpoint of its timber resources it is remarkable in the following particulars:

First. Diversity of types.—It contains practically all of the forest types found in the State, viz., the sprout hardwoods, as oak and chestnut; and the northern hardwoods such as beech, birch and maple. Spruce, pine and poplar are also found in large quantities.

Second. Abundance of second growth pine.—It is frequently said that Warren county possesses more second growth pine than any other county in the State and when it is realized that in the area within a radius of eight miles around Chestertown there are anywhere from twenty to twenty-five million feet of second growth pine, some idea of the importance of this county as a pine center can be gained.

DESCRIPTION

Warren county is located in the eastern portion of the State and is bounded as follows: on the east by Washington county; on the south by Saratoga county; on the west by Fulton and Hamilton counties and on the north by Essex county. It is roughly triangular in shape and, exclusive of lakes, contains almost 600,000 acres.

PHYSIOGRAPHY AND TOPOGRAPHY

The surface is very broken and mountainous; considerably less than one-half being capable of cultivation. The relief, however, is somewhat less abrupt than that of Essex county, as the mountains are rounder and the valleys broader. The general trend of the ridges is north and south. Elevations range from 340 feet at the extreme southern part of the county to 3,340 feet in the north-western part.

GEOLOGY AND SOIL

Gneiss is the chief rock underlying this area, while granite, crystalline limestone and serpentine are found in addition to the graphite and garnetiferous schists already mentioned.

The soil is, for the most part, a light sandy loam and in many cases underlaid with a layer of hard pan two to three feet from the surface.

Some clay is found in the valleys, giving a rich soil well suited for farming. On the other hand there are areas, *e. g.*, the Pine Plains at Glens Falls and the flat north of Chestertown, where the soil is nearly pure sand.

DRAINAGE

The drainage of Warren county is quite typical of a country that has been glaciated, swamps, small kettle holes, etc., being quite frequent. The two branches of the Hudson receive the bulk of the water from the western part of the county, while along the eastern margin it flows into Lake George and ultimately into the St. Lawrence.

The large number of streams in this county constitute a very important factor in the lumber business, as they furnish a very cheap method of getting the logs to the manufacturing centers.

Concerning lakes.—Lake George is by far the largest and most important, while Schroon and Brant lakes, etc., serve to store water during the season of scanty rainfall.

THE FOREST

Originally, Warren county, or more particularly, that part of it lying east of the Hudson was covered with a magnificent forest in

which pine and hemlock were well represented. (The country west of the Hudson has always been a spruce rather than pine and hemlock region.) These trees were the first to be taken when the country was opened up, and today stumps of the original growth can be found whose huge dimensions show the heavy cut that was obtained. At first, only the best was cut and in many cases the hemlock was cut for its bark alone and the trunks were allowed to rot in the woods. About forty years ago the last of the virgin timber was cut, the numerous tanneries closed down and to all appearances Warren county had ceased to be a factor as a timber producing region.

Within the past decade, however, a marked change has taken place and owners are commencing to realize that the pine seedlings previously cut down by the thousand to clear land for pasture have a great potential value and they are protecting their lands against fire and trespass, knowing that they will ultimately reap a harvest from these trees.

At the present time the bulk of the area is either culled or second growth, the only virgin timber being found on mountain peaks and other situations where the cost of lumbering was prohibitive.

TYPES OF FOREST

It is needless to say that in a reconnaissance of this sort, with a large area to cover in a short time, the results obtained must necessarily be quite general. For example, the map accompanying this report should be considered rather as a diagram indicating the approximate size and relative positions of the various types than as an exact survey. Type distinctions are necessarily broad and in many cases small areas of one type have been included in the prevailing one, as nothing less than 640 acres has been mapped unless of more than ordinary importance.

The following kinds of forest have been differentiated and mapped, viz.:

Hardwoods,	Pure pine,
Hardwoods with spruce,	Mixed forest,

Poplar type,	Scattered woodlots,
Swamp type,	Agricultural land.
Burned areas,	

The following basis was adopted for type differentiation:

Hardwoods: Includes both the northern and sprout hardwoods where the softwoods have been cut out to such an extent as to be negligible. May contain spruce and pine up to twenty-five per cent. of stand (trees per acre).

Hardwoods with spruce: Northern hardwoods with a spruce understory.

Pure pine: Pine over 50 per cent.

Pine mixture: Hardwoods, poplar, etc., containing pine from 25 to 50 per cent.

Poplar type: Poplar, white birch and hardwoods, with the first two species composing 50 per cent. and over of the stand.

Swamp type: Balsam, tamarack, black ash, etc.

Burned land: Areas burned since 1907. Areas burned previous to this time are now covered with poplar and are classed with that type.

Agricultural land: Open land, less than 15 per cent. covered with forest. Ordinarily nothing less than 640 acre tracts considered.

RELATION OF TYPE TO SITUATION

The area under consideration can be roughly divided into three regions:

First: The spruce region, lying west of the Hudson river.

Second: The pine region, lying between the Hudson and Schroon rivers.

Third: The hardwood region, lying east of the Schroon river.

In each case, the name of the region indicates the kind of forest that would grow there were it not for disturbing factors. Within these broadly defined regions there are certain exceptions.

The hardwoods are found wherever the soil is of fair depth and quality throughout all three of these regions.

On the higher elevations it generally gives way to spruce with hemlock appearing in considerable proportion on northern and northeastern exposures.

Balsam is found on the flats along the rivers and in the swamps where it is mixed with tamarack and black ash.

Pine is confined chiefly to the light sandy soils where it can make fast growth and ultimately crowd out the hardwoods. In this connection a peculiar fact seems worthy of mention.

Ordinarily the soil on the tops of hills and ridges is thinner and poorer than that on their lower flanks, but in the region around Chestertown it is a very common sight to see hill tops covered with a splendid growth of hardwoods, surrounded by a fringe of pure pine on the lower slopes. This might be explained in two ways; first, as the result of accident; that these slopes were originally cleared to furnish pasture, etc., and as the owners found the soil rather sterile and allowed the land to revert, pine seeded in on these old fields; and second, that the soil is natural pine soil. It can be conceived that during the period subsequent to the glacial epoch, the waters resulting from the melting ice deposited a deep layer of sand along these slopes, while the tops remained above the water and weathered down to a fairly rich loamy soil unmixed with sand, which would be suitable for hardwoods. This explanation is purely hypothetical, but it cannot be denied that the soil on the tops of these ridges is of far better quality than on the lower slopes.

The poplar and fire types are purely artificial and temporary and will be considered under the separate type descriptions.

AREAS AND YIELD

As stated in the beginning, the results obtained in a study of this sort must be quite general, so in the table below both areas and yields must be considered as simply estimates, arrived at after five weeks field work in the county during which numerous mill men, lumbermen and landowners were consulted.

While in some cases, notably that of the pine type, considerable areas of unmerchantable land are included within the limits desig-

nated, nevertheless this has been allowed for by making the yield per acre very conservative. A table of this sort will at least serve the purpose of indicating the approximate amount of material to be found within the county. The figures given represent the writer's idea of the merchantable contents of each type; for saw or pulp timber in all types except in poplar where cordwood is the size of material in demand.

Concerning the fire type: This timber is deteriorating so rapidly that it was thought best to leave it out of the calculation. In the same way, the contents of the scattered woodlots in the farming regions were omitted, as the stand would be extremely difficult to determine in the first place and chiefly valuable for firewood besides.

Type	Area * acres	Per cent	Yield in markets
Hardwood	270,000	48.9	4,050 M.
Hardwood and spruce	62,000	11.3	1,550 M.
Pure pine	25,000	4.5	300 M.
Pine mixture	14,000	2.5	84 M.
Poplar	70,000	12.7	1,680 M.
Swamp	3,000	.5	48 M.
Fire	45,000	8.2	.....
Agricultural land	63,000	11.4	.....
Totals	552,000	100.0	7,712 M.

* Except that included in larger lakes.

DESCRIPTION OF TYPES

HARDWOODS

Under this head come the northern hardwoods, both virgin and second growth and the sprout hardwoods. The dividing line between these sub-types extends from Hadley to a point on Lake George about five miles above Bolton Landing.

Back from the railroad towns and manufacturing centers, the virgin forest is the rule; originating from seed; canopy practically unbroken; deep litter and good humus conditions; ground cover

composed of witchhopper, dogwood, grasses and ferns. Reproduction, chiefly maple and beech. Of the softwoods, spruce and hemlock are often found seeding in, but the shade is too dense for pine.

The proportion of species would be about as follows: Maple, 40 per cent.; beech, 30 per cent.; birch, 20 per cent.; miscellaneous, 10 per cent.

Concerning the stand per acre: Some of the second growth will yield no saw timber and only 10-12 cords of fuel wood per acre. On the other hand, the virgin woods may run as high as fifteen to eighteen thousand board feet or eighty to ninety cords per acre. I would put the average at about three thousand board feet or about twenty-two cords per acre, if fuel wood were used as the unit.

Past Management.—Close to the railroad, or near towns, this type has either been culled for building material or cut clear for cordwood, while in less accessible regions it has remained untouched.

Future Management.—To suggest a practicable scheme for management for the northern hardwoods at the present time is a rather difficult problem, unless the tract is within easy reach of a railroad, as water transportation is out of the question. If a good market for all kinds of materials is at hand, the plan that appears most feasible would be a clear cutting operation followed by planting with softwoods, taking advantage of the young growth already on the ground to furnish side shading. It is certain that soil which will produce merchantable hardwoods will prove favorable for spruce and the rapid growing Norway spruce should make good growth.

HARDWOODS WITH SPRUCE

The description of the above type concerning canopy, humus, soil cover, etc., can be considered to hold true for this type also, with these exceptions: 1st, hardwood is generally in virgin condition; 2d, the amount of birch is usually greater; and, 3d, the understory of spruce is an added condition found in the more remote portions of the county. Yield per acre would average about 5,000 feet.

Past Management.—This type has been culled for soft woods only and in many cases a good stand of spruce is now coming along. The ideal treatment in this case would be to thin out the hardwoods in order to give more light and growing room to the soft woods beneath; but this, on account of transportation cost, is in many cases entirely out of the question at the present values for hardwoods.

PURE PINE

This type, containing approximately 25,000 acres, constitutes the most interesting and at the same time the most important feature of Warren county, when considered from the forester's standpoint. In view of the rapid disappearance of this species, the most valuable of our building woods, this supply of second growth pine represents a most valuable asset to the county and to the State; and its protection and economical use should be insisted upon not only by the owners but by the State at large. Several reasons are apparent for the excellent growth of pine in this region. Briefly expressed, they are as follows:

First: It is a natural pine soil. The light sandy loam, or in some cases an almost pure sand, is an exceedingly receptive seed bed for the pine.

Second: There has been an abundant supply of seed trees left owing to the method of cutting, *i. e.*, successive removals. At first only the cream was taken, but later, owing to the increase in the value of white pine, timber at first considered worthless became valuable. However, owing to water transportation, as much as to any other factor, which permitted the removal of logs without a heavy initial investment, this region has been spared the complete denudation seen in the Lake States.

Third: The owners and residents have been very conservative and careful, especially on the question of fire. At this time of comparative indifference to the vanishing timber supply it is a most refreshing change to hear the owner of a hundred acre pine lot discuss the growth and future value of his holdings, realizing that while he may not reap the crop himself, that nevertheless it is a tangible asset to leave to his heirs.

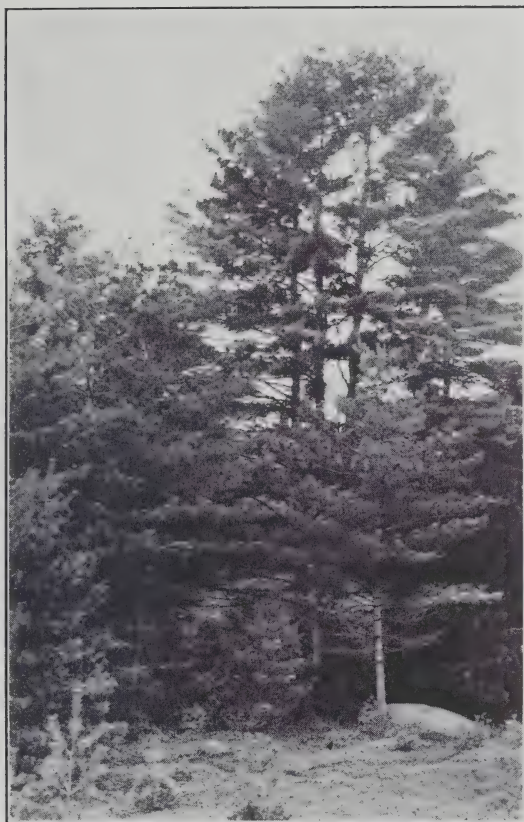


Photo F. F. Moon.

Large White Pine Which Has Seeded Surrounding
Territory. Should be removed for benefit
of young growth.

As has been stated before, the soil here is naturally receptive for pine, but several conditions controlling the species which take possession of different sites might be noted. If a pasture on a sandy hillside is allowed to revert, the pine will seed in. If, however, the pasture has been cropped very close and the soil compacted by heavy tramping, poplar, birch and pin cherry form the first generation, generally succeeded by pine.

If a field is allowed to revert just after being cultivated, grass and weeds must take possession first before the pine will catch.

It would seem that the compacted sod and perhaps the exposure of the seed to the drying effect of the sun prevent the successful germination or growth of the young seedling.

The origin of the pine type is, of course, from seed, and in density it varies from an open field with a few small pines to a heavily stocked stand having a complete canopy. The humus conditions, where there is any canopy, are generally good, though the warm sandy soil prevents any heavy accumulation. The ground cover depends greatly on the density of the stand, varying from the pasture grass to the ferns, viburnums, dogwood, etc., of a normally stocked stand.

Reproduction is unusually good, especially on the open fields, dense thickets of young pines springing up around the seed trees.

In openings made by the removal of the mature trees, seedlings come up in great abundance, so that on the score of reproduction this region has no cause for alarm.

Concerning the rate of growth, conditions are equally favorable. In the pine regions of eastern Massachusetts, southeastern New Hampshire and southwestern Maine they figure on one thousand board feet per acre per year as the mean annual growth of a fully stocked stand of pine. From the figures quoted by old inhabitants who have seen pine cut from lands which they remember as mowing lots, it seems that this figure (1,000 bd. ft.) will be equalled, if not surpassed.

The general tendency for pine is to grow in pure stands and this is the condition usually found in the case of abandoned pasture.

However, it occurs mixed with poplar and the hardwoods in varying proportions, but unless the pine comprises 50 per cent or more (by numbers) of the stand, it has been put into another type.

Past Management.—Although the first mill in Warren county was erected at Warrensburg in 1798, it was not until 1820 that the pine industry really got started. With this in full swing, the hemlock exploitation began about 1846, and from then to 1860 this county was a great tanning, as well as pine, center. From that time on the cut has been chiefly second growth, though even today occasional first growth logs are found at sorting booms.

As has been stated before, the method used was that of culling the forest, so that at no time were large areas clear cut to burn over and become desolate wastes. The same general method is in use to-day. A land owner will sell his pine down to eight inches or ten inches at the stump at so much per market standing; or else, if he has the time, will contract to deliver so many markets at the river bank. This thinning method insures a sufficient number of seed trees and, as there are trees still standing, care will be taken that fire does not burn over the logged area.

Future Management.—There is one drawback to this scheme, however. Pine is not especially tolerant of shade at any time in its life and its intolerance increases with age. Thus, an even aged system where every tree is competing with one of its own age not only insures more rapid growth but also straighter, cleaner boles and therefore more valuable lumber.

Three general methods of mangement suggest themselves depending on various conditions. The conditions are as follows:

First: Pure pine comparatively even aged. At the present time, timber values in this country have not reached the point where we can tie up large sums in thinning stands at an early age; so it will be necessary to postpone the cutting of superfluous trees until they are large enough to pay at least the cost of their removal—say twenty-five to thirty years. At this time, if the stand is fully stocked, there may be anywhere from five to seven hundred trees to the acre. The proper plan would be to select about two hun-



Photo by F. F. Moon.
Natural Reproduction of White Pine in an Old Pasture.



Photo by F. F. Moon.
Natural Reproduction of Poplar on Burnt Hillside Near Brant Lake.

dred of the straightest and best formed trees on each acre and figure on these as forming the final crop. Trees surrounding the selected individuals should be cut in order to give crown and root room and allow them to increase the diameter growth. This operation should be repeated whenever the trees become crowded. When a stand of this kind finally matures (50 to 55 years is the economic rotation for pine) a clear cutting operation would be the ideal method, leaving three to five seed trees per acre if natural reproduction is desired, or planting up the cut-over area with small seedlings would be the other alternative. By growing in close stands for the first thirty years, the following advantages are gained: 1st, height growth is increased by reason of competition for light; 2d, after about ten years the side branches meet and the natural pruning takes place; 3d, the early formation of a canopy keeps the soil in a higher state of productivity.

Second: Pure stands (uneven aged). See illustration. This condition is found on pastures that are beginning to revert and are only partially covered with seedlings of various ages, or where a pine lot has been thinned leaving the sprawling unmerchantable timber behind and seedlings growing in the openings. In this case the operation is different. If there are enough trees already on the ground, but poorly distributed, the proper plan would be to cut down the big trees that have passed their stage of profitable growth and by transplanting trees from the thickest areas to the blank spots, form a full stand spaced as near 6ft. by 6ft. as possible. If there are not enough trees on the ground to do this, the purchase of trees to fill in will be more economical than waiting for natural reproduction.

The third condition is that of pine in mixture which will be treated under management of that type.

Opportunities for the Practice of Forestry.—Within the pine region there are many thousand acres that are at the present time more suited for the growing of trees than for crops. It is true that light sandy soils are excellent for market gardening, but the intensive cultivation and heavy fertilizing that this entails demand close markets and high prices for the product so that, within the

next generation, it is doubtful if these lands will command prices high enough to put forestry out of the question and prevent the growing of trees at a profit. With the manufacturing centers close at hand and cheap water transportation, a reasonable investment either in reforestation, or thinnings should yield a good return.

In addition to the strictly economic side of forestry in this region, the many hundreds of acres owned by summer residents could be put under management with the idea of increasing their beauty as well as their productivity. At the present time, however, the chief care of this type of owner seems to be the prevention of fire and trespass, and the idea of improvement thinnings, etc., is by no means prevalent.

Examples of Forestry.—Nevertheless the general sentiment of this region regarding forestry is decidedly healthy, although to the bulk of the owners, "forestry" is rather a vague term. The most striking example of forestry or at least reforestation is the systematic planting scheme that has been carried on by Mr. William H. Faxon of Chestertown for the last twenty-five years. Mr. Faxon is an extensive land owner and has made it a custom to set out each year anywhere from three to ten thousand trees. Photographs and descriptions of two of Mr. Faxon's plantations will be found on opposite page.

Another example of foresighted management of pine land is that exercised by Mr. Daniel Lynch of Minerva, Essex county (a few miles north of the Warren county line). Mr. Lynch owns about forty acres of pine land which he cuts over from time to time and saws at his own mill. His plan of operation is this: He aims to cut no more than the land will grow each year. He selects only the mature trees (minimum diameter limit 10 in.) and sees that each tree is closely utilized. Such examples as the two quoted above indicate the trend of sentiment concerning the use of true forest soil in this region.

PINE MIXTURE.

In the case of this type the conditions vary widely, ranging from a poplar stand, with pine coming up beneath, to hardwoods



Photo by F. F. Moon.

Woodlot of Daniel Lynch, Minerva, N. Y. The thinned area is an example of forestry.



Photo by F. F. Moon.

Red Pine on Gravelly Soil Near Schroon Lake.

and pine with all gradations between; but in all cases the pine forms from twenty-five to fifty per cent of the stand. The pine is, of course, of seedling origin but the hardwoods forming the balance of the mixture may be either from seed or from sprouts.

The conditions regarding canopy, humus, form, etc., are, like the composition, extremely variable, though for the most part this type is confined to steep slopes and ridges where the growth is scrubby, and hardly worth removal at the high cost that would be necessary. In some cases, however, the pine is of good form and within a few years will furnish a splendid cut. The chief value in both cases is the fact that the pine in the mixture will serve as seed trees and by proper cuttings the proportion of this valuable species can be greatly increased.

Future Management.—Concerning the treatment for this type, the plan in brief would be to favor the pine in every way possible both to hasten the growth of the trees (thinning around selected trees as above) now on the ground and when removing the crop, to cut the hardwoods to a lower diameter limit than the pine, thus providing for plentiful natural reproduction.

In the case of the poplar and pine mixture the pine will ultimately take possession of the soil, as the poplar tends to die off in somewhere around forty years. Instead of awaiting the actual death of the poplar, the better plan would be to thin out this species every five or ten years, which would not only give the pine a chance to seed in but also increase the financial returns (see future management of poplar).

POPLAR TYPE.

This type stands next to pine from the viewpoint of interest and economic importance. Originating from seed, large areas growing up to poplar, white birch, etc., are generally a good sign that the site in question has been burned over. Occasionally, however, spots are found where the poplar has seeded in extensively with the young hardwoods. This seems to be due to the fact that the poplar seeded in just after the area had been cut over and the poplar seedlings are coming up with the sprouts.

This species possesses very light foliage and like most intolerant

trees does not form a closed canopy and for both reasons the humus is very slight. The ground cover generally consists of grass, ferns, flowering weeds, etc.

Reproduction is good, as a large amount of light downy seed is produced early in the spring which is widely scattered by the wind but rapidly deteriorates through drying. Poplar also reproduces extensively by suckering from the roots, which fact has a very important bearing on its management and will be considered at greater length under that heading.

The white birch, maple, etc., also reproduce abundantly from seed and also sprout from the root collar, so that reproduction of the chief species composing this type is all that can be desired.

Concerning growth: While no measurements of any large number of trees have been taken the few specimens examined indicate that at twenty years of age the diameter breast high may be anywhere from seven to ten inches or from three-tenths to five-tenths inches diameter growth per year. Mean annual growth of a fully stocked stand of pure poplar will range from three-fourths to one cord per acre per year.

Past Management.—On account of the great demand for poplar for pulpwood, excelsior stock, etc., the custom has been to thin out poplar stands long before they have reached maturity (say at fifteen to twenty years). While no doubt certain advantages are gained by so doing, viz., poplar reproduction is secured and by cutting young there is no falling off in the growth rate, nevertheless it would appear that by waiting for five to ten years more a much larger cut could be obtained and reproduction could be assured as well.

Future Management.—The ordinary conception that poplar is a temporary type coming in usually after fire, lasting for one generation (forty to fifty years) and then giving way to a softwood or mixed stand, seems to be only partially true from instances seen on this investigation. While it is true that if left untouched a poplar stand will follow the course above mentioned, nevertheless there is a poplar tract near Stony Creek that has had four cuts of poplar



Photo by F. F. Moon.
Hardwood Type of Forests.



Photo by F. F. Moon.
A Stand of Poplar that has been Thinned four times during the past 20 years. Each time from 4 to 5 cords of pulp wood per acre has been removed.

taken off within the last twenty years and another cut is almost ready now, thus proving that poplar will reproduce under its own shade and by proper cutting a tract can be made to yield poplar apparently indefinitely.

In view of the fact that poplar is about the fastest growing of our northern trees and that its value for pulpwood is equal to spruce, the significance of this point can be realized, for with a mean annual growth of even three-quarters of a cord per year, worth \$2.00 to \$2.50 per cord on the stump, the yearly return per acre will be from \$1.50 to \$1.80. In addition, this return can be gotten at short intervals instead of waiting fifty to sixty years, as is the case with pine.

Thus the ideal treatment would be to thin over a poplar stand when it reaches the age of twenty or twenty-five years, cutting nothing below five inches. This method will allow the trees already on the ground to fill in the open spaces by seed and by suckering, and accordingly, if the Rugg lot before mentioned is any criterion, another cut would be ready at the end of five years.

There is one drawback to this plan, however, and that is one of soil deterioration. It is generally recognized that to keep forest soil up to its highest productivity it must be well shaded, and this condition would not be complied with in the plan outlined above. To this end it might be suggested that wherever pine or spruce, etc., seeded in beneath the poplar, the stand should be allowed to come to complete maturity (or cut only when the pine, etc., is being interfered with) and so strive for a poplar stand with a pine or spruce understory.

SWAMP TYPE.

This type at the present time is of comparatively small importance both as to size and economic possibilities. It is situated on the flats and along streams where the moist, cool soil is favorable for the successful germination and growth of balsam, tamarack, etc. The canopy is generally pretty well established; litter and humus quite deep. Balsam is by all odds the most important tree in this mixture although at the present time the presence of young tamarack in many of the swamps, etc., indi-

cates that this species is recovering from the disastrous attack of the saw fly some forty years ago and may ultimately become important. Black ash, when present, is generally represented by dying veterans or stubs.

Management.— This type, if of any extent, is usually cut over for pulp wood rather than lumber and that, indeed, is about all it can be expected to yield (larch should ultimately grow to pole size, however), as the growth rate falls off early on cold, moist sites. To this end clear cutting methods should be adopted (as on account of windfall, thinnings are risky) leaving several clumps of seed trees per acre selected for wind firmness to seed up the ground.

BURNED AREAS.

This type by definition includes lands that have been burned over subsequent to 1907 and, in fact, the bulk of the area represents the burnings of 1908. At the present time this land is simply a charred waste with the blackened stubs and down timber showing the terrific damage that was done; damages in many cases that it will take a century or more to repair.

Corner Mountain, situated in the northwest corner of the town of Thurman, furnished an interesting example of the way in which nature heals over these fire scars.

On the lower slopes the ground was covered with a tangle of berry bushes and fire cherry with poplar and white birch just beginning to seed in. A little higher up the birch and poplar had disappeared and still higher the berry bushes alone covered the ground. From all accounts, berries, fire cherry and lastly poplar and white birch is the order in which these species seed in on a burn.

Management.— According to every tenet of forestry which holds that each acre of nonagricultural soil should be used for forest purposes, this land should be cleared of its dead and down material, which only serves to make these areas a fire trap; and wherever there is any soil left, see that a new forest is started. In some cases nature has already established a stand of poplar; in others



Photo by F. F. Moon.

Young Pine Grove in Need of Thinning.

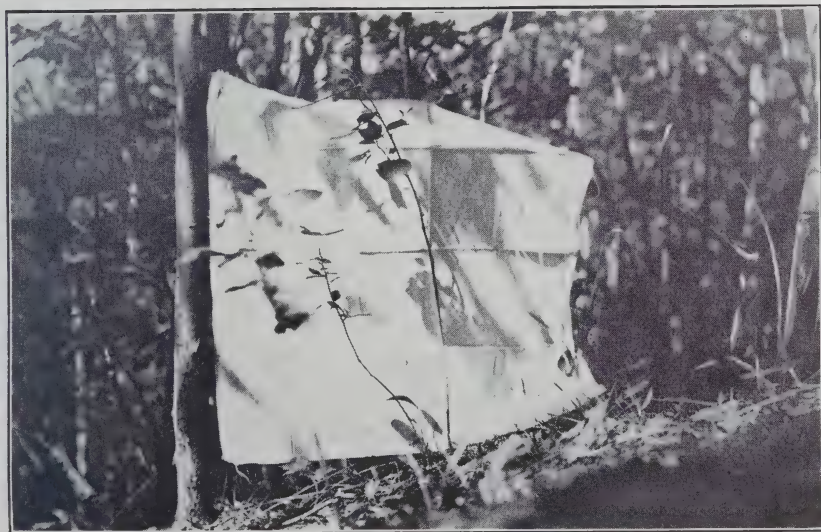


Photo by F. F. Moon.

Poplar Reproducing Itself Under its Own Shade.

so great is the extent of the fire that seed trees are exceedingly remote and the only practicable method would be planting. Against this plan there are two objections:

1. The enormous cost that such a project would entail when, in addition, the citizens of this State are already asking for more trees than the State can supply.

2. The present constitutional provision which prohibits the selling of dead and down timber. Without clearing away the debris, planting would not only be out of the question but even, if possible, any plantation established would be subject to extreme fire risk during the first dry season. Thus, under the circumstances the only plan possible is to let these acres be filled in by natural seeding.

AGRICULTURAL LAND

Under this head comes land that has been cleared for farming purposes, pasture, etc., and may contain up to fifteen per cent. of forest land. The "pine plains" around Glens Falls is the largest block of this type within the county.

For the purpose for which this study is intended, this type is of little importance except as indicating the small amount of agricultural soil (at least in blocks of 640 acres and over) found in Warren county.

Some of the land included in this type is of doubtful agricultural value and unless used for fruit production, sheep pasture, etc., might better be growing pine.

ENEMIES

As is usual in any timbered area, certain conditions prejudicial to the maximum growth and development are found. Concerning pine, the chief enemies are the pine weevil and the leaf blight. Many cases are found where the leader of a young pine has been killed by the young grub and a side branch has turned up to replace the leader, thus producing a deformed trunk.

Such methods as spraying or cutting off and burning the leader with the larvae inside are only practicable in case of shade trees and as a remedy for large areas are entirely out of the question.

Inasmuch as a close stand is less liable to weevil attacks, the best course to pursue would be to bend every effort toward getting a full stand as soon as possible.

Concerning the leaf blight little definite advice can be given. While undoubtedly many trees have died from this fungus disease, it does not seem advisable to thin out the trees until they are actually dead, as they have a good chance for recovery.

Other minor enemies are found, such as the elm leaf beetle, maple borer, etc., but the actual amount of damage they do to forest growth is very slight.

There is one, however, viz., the hedge hog, which is said to be playing havoc with young hemlock. Some landowners claim that the question is so serious that a bounty should be put on the porcupine to save the coming generation of this tree.

Concerning damage by fire: this subject has already been discussed above. It is hardly necessary to say further that this enormous loss could be entirely avoided, or at least greatly diminished, by the exercise of proper precautions by railroads, etc., on the one hand, and by every person going into the woods on the other.

GROWTH STUDIES AND UTILIZATION

On account of the limited time and funds available no growth studies were made, nor was it possible to secure desired information in regard to the present method of utilization. These facts, together with growth studies, should be secured.

OWNERSHIP AND VALUES

Of the 552,000 acres of land in Warren county the State is the largest owner, holding 125,000 acres or about 24 per cent.

The private holdings range in size from a few acres to several thousand, with lots of 160 acres as the average. Values of land range from \$5 to \$20 per acre for the average farm land, while for timber properties anywhere from \$1 to \$100 per acre is quoted, depending on the contents. One tract of pine land containing 40 acres, situated in the town of Bolton, was bought for \$10,000

several years ago and within a year was sold for \$15,000, but such prices are extremely rare.

Assessed values are anywhere from one-half to three-quarters of sale value or, as one assessor expressed it, what the property would bring at a forced sale. Tax rates vary from town to town—in some as low as 16 mills, while in others as high as 40 mills on the dollar; but it is only fair to add that the latter rate is found only in towns building State roads and, as soon as they are completed, the ordinary tax will be resumed.

POPULATION

The census of 1900 gives the population of Warren county as 30,000 of which 17,000 are in Glens Falls and Warrensburg, leaving 13,000 in the agricultural and timbered sections of the county.

Of those living in the towns, quite a percentage would be vitally affected by anything disturbing the lumber and pulp business, as the total number of hands employed in these and kindred trades is quite large.

LUMBER MANUFACTURE

Glens Falls is by all means the most important lumber manufacturing center of Warren county with Warrensburg second on the list. A large amount of the timber coming down the Hudson is manufactured at Hudson Falls, Washington county. The lumber output of Warren county for the year 1909 was as follows:

Spruce	8,168,000	bd. ft.
Hemlock	3,495,000	" "
Pine	2,800,500	" "
Maple	911,000	" "
Birch	497,000	" "
Beech	496,000	" "
Basswood	484,000	" "
Oak	306,000	" "
Chestnut	219,000	" "
Elm	695,000	" "
Ash	176,000	" "

Poplar	63,000	bd. ft.
Cherry	2,500	" "
Miscellaneous	204,000	" "

Total 17,893,000 bd. ft.

Of other products besides saw timber the figures were as follows:

Shingles	464,500	pieces
Lath	10,092,500	"
Staves	200,000	"
Ties	1,900	"
Posts	8,236	"
Poles	600	"

In addition, there were about 17,000 cords of pulpwood used.

TIMBER VALUES AND COST OF PRODUCTION

Concerning the values for raw material the range is wide, depending entirely on the quality of the material and the distance from market. The following list will give an idea of the current prices:

Stumpage Prices

Spruce	\$0 60—\$1 00	per market
Pine	1 00— 2 25	" "
Hardwoods	60— 2 00	" "
Hemlock	60— 1 50	" "
Hemlock bark	2 00— 3 00	" cord (2,200 lbs.)
Poplar and basswood...	2 00— 2 50	" "
White birch	50— 1 00	" "

Prices at Mill and River Bank

Spruce	\$2 00—\$3 00	per market
Pine	2 00— 3 00	" "
Hardwoods	1 50— 2 50	" "
Hemlock	1 50— 2 75	" "
Hemlock bark	6 50	per cord
Poplar and basswood.....	6 50	" "
White birch	4 50	" "



Photo by F. F. Moon.

White Pine Grove Near Chestertown, Height Growth
Has Been Obtained and the Stand is in Need
of Thinning.



Photo by F. F. Moon.

Natural Reproduction of White Pine in an Opening After Lumbering.

COST OF LUMBERING AND MANUFACTURE

The best index of the logging cost can be gained by subtracting the average stumpage value of any species from the value of that species delivered.

This method would not give any idea of the costs of some of the separate processes involved so a few cases are given below.

Poplar

Cutting, 75 cents per cord.

Peeling and stacking, \$1.25 per cord.

Hauling, \$2 to \$3 per cord, depending on distance.

Hemlock Bark

Cutting and peeling, \$2 per cord.

Piling and hauling, \$2.50 per cord (based on one trip haul).

Hardwood

One concern cutting from their own tract, three miles from their mill estimated the cost of cutting, skidding and hauling to be 60 to 75 cents per market.

Driving

A large concern situated at Glens Falls estimates the cost of driving from the foot of Glens Falls to their mill at \$0.15 per market, with 15 cents added when the logs have to be warped across the lake.

Concerning the actual cost of manufacture, *i. e.*, sawing and piling, the chief factor is the size of the plant and the output. One mill manufacturing about ten million feet per year estimates the cost of sawing at \$1.80 per M. board feet and 20 cents for piling.

The usual prices for custom sawing are \$3 per M. for softwoods and \$4 per M. for hardwoods.

VALUES OF PRODUCTS

The following quotations for the finished products were obtained:

Softwoods

Pine boxboards	\$18 per M.
Pine, No. 1.....	\$26 to \$28 per M.
Hemlock, No. 1.....	\$22 per M.

Hardwoods

Ash	\$25 per M.
Beech and maple.....	\$12 to \$18 per M.
Birch	\$16 to \$25 per M.

Minor Products

Cedar shingles, No. 1.....	\$4 per M.
Cedar shingles, No. 2.....	\$3 per M.
Cedar posts	8 to 15 cents each
Cedar poles, 25 ft. long.....	\$1 delivered
Cedar poles, 35 ft. long.....	\$1.50 to \$1.75 delivered

OTHER INDUSTRIES

In addition to the lumber and pulp concerns, Warren county can boast of other industries of considerable size. Glens Falls possesses a large cement plant and numerous shirt factories; Warrensburg has its shirt and woolen mills and, back in the county, the garnet and graphite mines turn out extremely valuable products.

Agriculture at the present time is not being carried on in a very aggressive manner, although occasional farms are found that are managed on scientific principles. The chief crops are hay, potatoes, oats and corn.

TRANSPORTATION FACILITIES

Concerning transportation Warren county is very fortunate. The Adirondack Division of the Delaware & Hudson Railroad extends to within a few miles of the Essex county line in the western portion of the region, and along the eastern borders the Lake George steamers, connecting with the Delaware & Hudson Railroad at Caldwell, take care of the freight, etc., from this section.



Photo by F. F. Moon.

Faxon Plantation at Chestertown. The White Pine trees 15 years after planting.



Photo by F. F. Moon.

Faxon Plantation Eight Years After Planting.

Although there are a few large blocks of territory that are not traversed by regular worked highways, nevertheless the county as a whole is well provided with roads and with the extension of the State road system will rank very well with the other Adirondack counties.

As has been stated before, the number of streams are an extremely valuable asset in that they provide a cheap method of transportation of lumber to the mills.

CONCLUSIONS

In view of the fact that from present indications only 63,000 acres or 11.4 per cent of the land of Warren county is suitable for agriculture, it can be realized that forestry will play an important rôle in the development of this section; and many points are in its favor, viz.:

1. Timberland is in large blocks, thus rendering systematic management on a large scale possible.
2. With railroads for the hardwoods and numerous streams down which the softwoods can be floated, the transportation question is satisfactorily answered. Warrensburg, Glens Falls, and Hudson Falls are advantageously situated markets for the softwoods, and while at the present time only the highest grades of hardwoods are valuable enough to bear the cost of shipping to Albany, Boston, etc., there is no question but the next decade will see a far greater demand for these species, thus giving them a far wider market.
3. Land values quoted at the present time are reasonable and when considered in connection with assessed values and tax rates, make it highly possible to buy timber land for an investment; or in the case of pine, to grow trees to a merchantable size at a profit.
4. Concerning the safety of timber land as an investment, it is true that in the past the risks were very large but with the present effective fire organization maintained by this Commission, backed by the campaign of education that it is conducting, the outlook is very bright for ever-increasing safety.

Considering the situation in Warren county as a whole, the outlook is very promising and when, in the coming years, advancing prices have put the lumber and pulp concerns on the stable basis of forest management, it will be realized that these non-agricultural acres are the biggest asset that Warren county possesses.

SPECIES IN WARREN COUNTY

CONIFERS

White pine	<i>Pinus strobus</i>
Pitch pine	<i>Pinus virginiana</i>
Red pine	<i>Pinus resinosa</i>
Tamarack	<i>Larix americana</i>
Red spruce	<i>Picea rubens</i>
Hemlock	<i>Tsuga canadensis</i>
Balsam	<i>Abies balsamea</i>
White cedar	<i>Thuja occidentalis</i>
Juniper	<i>Juniperus communis</i>
Red cedar	<i>Juniperus virginiana</i>

HARDWOODS

Butternut	<i>Juglans cinerea</i>
Walnut	<i>Juglans nigra</i>
Shagbark	<i>Hicoria ovata</i>
Mockernut	<i>Hicoria alba</i>
Pignut	<i>Hicoria glabra</i>
Trembling aspen	<i>Populus tremuloides</i>
Large tooth aspen.....	<i>Populus grandidentata</i>
Willow aspen	<i>Salix</i>
Hornbeam	<i>Ostrya virginiana</i>
Black birch	<i>Betula lenta</i>
White birch	<i>Betula papyrifera</i>
Beech	<i>Fagus americana</i>
Chestnut	<i>Castania dentata</i>
Red oak	<i>Quercus rubra</i>
Black oak	<i>Quercus velutina</i>

Scrub oak	<i>Quercus nana</i>
White oak	<i>Quercus alba</i>
White elm	<i>Sorbus americana</i>
Mountain ash	<i>Ulmus americana</i>
Bird cherry	<i>Prunus pennsylvanica</i>
Wild black cherry.....	<i>Prunus serotina</i>
Black locust	<i>Robinia pseudacacia</i>
Striped maple	<i>Acer pennsylvanicum</i>
Sugar maple	<i>Acer saccharinum</i>
Red maple	<i>Acer rubrum</i>
Basswood	<i>Tilia americana</i>
Black ash	<i>Fraxinus nigra</i>
White ash	<i>Fraxinus americana</i>
Tree of Heaven.....	<i>Ailanthus glandulosa</i>

FOREST CONDITIONS OF ONEIDA COUNTY

BY

JOHN W. STEPHEN, M. S. F., State Forester

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FOREST CONDITIONS OF ONEIDA COUNTY

INTRODUCTION

The different counties of the State of New York show a great diversity in soil, climate, productions, and natural resources. Some, on account of favorable soil and climatic conditions, are especially adapted to the raising of fruits. Others have great stretches of undulating meadowland, noted for the production of grains and vegetables. There are others whose well-watered hillsides and valleys are the grazing places of millions of cattle that have made New York one of the greatest dairy states of the Union. There are still others occupying the more rugged and elevated regions that are and should continue to be the great timber producing regions of the State.

Oneida county would not be included wholly within any one of these classifications, but from the variety of its natural resources it would be considered a combination of all. It has some of the most fertile and productive soil to be found anywhere within the State. This is especially true in the vicinity of Waterville, where one of the leading hop growing districts of the United States is located. The surrounding hillsides are adapted to the production of grass and throughout the county the dairy industry ranks at the head of all agricultural pursuits. There are broad stretches of fertile lands throughout the central portion, productive of grains, fruits and vegetables and there are rugged portions and broad areas of sandy soil that are better adapted for the growth of timber than for any other purpose.

The entire area was originally covered with a heavy timber growth. It has been lumbered at various times. Wherever timber is found, it is largely second growth. The greater part of this is found in small areas connected with farm land and belongs to the scattered woodlot type. There are no large areas of timber found

in the county at the present time, but there are larger areas of sandy soil in the northern part that will eventually be covered with a forest that are now covered with little but brush. This region naturally belongs to the pine type. The swamp type is found in low lying valleys and prehistoric lake basins. It is of very little importance because it makes but a very small per cent of the entire forested area.

DESCRIPTION

Oneida county contains 720,778 acres, is centrally located, and occupies a region surrounding the headwaters of the Mohawk. It contains the divides separating the watershed of the Mohawk from those of the Susquehanna and the St. Lawrence. It occupies an important position because it extends far enough north to include a portion of the land that should always be forested and far enough south to include lands that are agricultural in their nature. Much of Lewis county on the north and Herkimer on the east is included in the permanent timber region, while Madison on the south and west with Oswego on the west, ranks it along with important agricultural interests.

PHYSIOGRAPHY AND TOPOGRAPHY

The lowest part of Oneida county is found near the shore of Oneida lake. The elevation is about 400 feet. There is a belt of low country extending east and west across the entire county. This is narrow in the east where it contains the valley of the Mohawk and broadens out toward the west like a fan until it includes all of the lowland adjacent to Oneida lake. At no point does it reach more than about 450 feet elevation. From this low lying belt, it rises more or less abruptly, both toward the north and toward the south, until it reaches the highest point in the county, 1944 feet in the southeastern part of the town of Marshall. The highest point north of the low lying belt is found in the town of Steuben, where it reaches an elevation of 1780 feet. The county, outside of the low belt, is made up of narrow valleys separated by broad ranges of hills. The valleys contain the streams and drainage systems. The hills rise abruptly from the narrow valleys and form broad rolling tablelands several hundred feet above the intervening valleys.



Photo by J. W. Stephen.

Natural Reproduction When Stock is Excluded.



An Example of Thinning Natural Forest Growth. Thinning has been made in the foreground, while a portion to the rear has not been thinned.

Photo by J. W. Stephen.

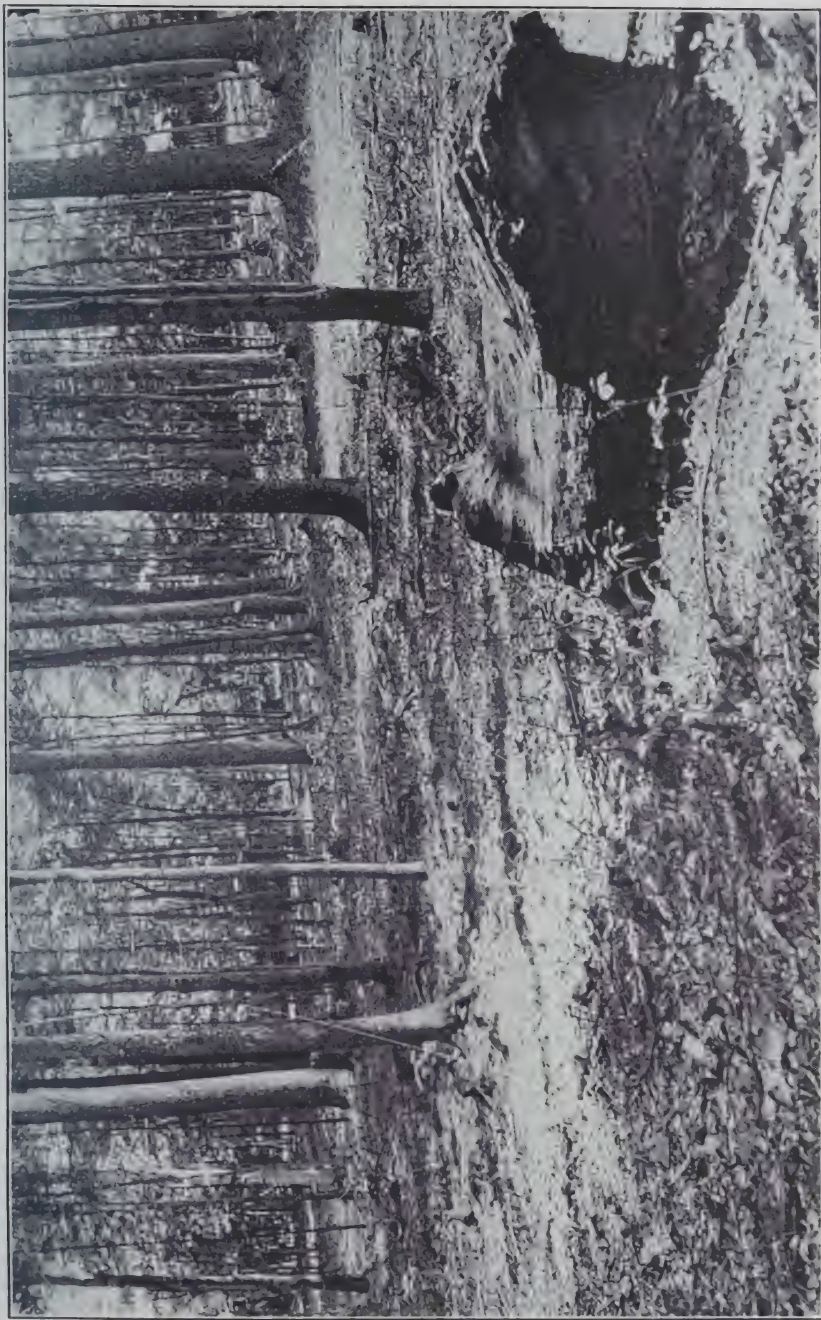


Photo by J. W. Stephen.

Wood Lot Which Has Been Properly Thinned.

GEOLOGY

Geologically this region is part of the great glacial drift. This is shown by the presence of numerous moraines and valleys, the result of the action of the ice sheet.

The underlying rock shows considerable variety. The northeastern part of the county from Boonville in a straight line to the boundary of Herkimer county east of Hinckley is part of that great granite region so prevalent in the Adirondacks. The Trenton limestone occupies the valley of the Black river from Lewis county where it is about three miles wide south east to Herkimer county where it reaches a width of seven miles at Trenton and extends to a considerable distance up the valleys of the streams.

Utica slate covers the greater portion of the towns of Steuben, Floyd, Deerfield, and a large part of Trenton. Grey sandstone covers Camden and Florence in a broadening belt as it extends out toward Lake Ontario.

Oneida conglomerate is common in many sections of the county as an outcropping and underlies large areas throughout the county.

Belts of limestone and sandstone rock extending in a southeasterly direction are found from Oneida lake southward as far as Augusta and Waterville and limestone rock is continued over the entire eastern half of Bridgewater. These belts vary from limestone and sandstone to limestone and shale and farther south become limestone alone. Southern Augusta, Sangerfield and western Bridgewater are covered with shale and sandstone.

THE SOIL

The soil resulting from the weathering of so great a variety of bedrock is naturally varied in its composition. Peat and muck deposits of great depth are found in prehistoric lake basins. Clay loams cover a large per cent of the surface of the county. These vary greatly in depth, large areas being covered so thinly that cultivation is carried on with difficulty, and in many cases the bedrock projects above the surface making it unfitted for crops. Sand loams are found in certain sections that give good returns

under cultivation, and there are other large areas that are covered with a sandy soil too light for cultivation, but suited to the growth of certain species of timber.

DRAINAGE

The divide separating the watershed of the Mohawk from that of the Susquehanna enters Oneida county from Herkimer near the southern boundary of the town of Paris and extends westward to the eastern boundary of Augusta. Here it turns north and becomes the divide between the Mohawk and the St. Lawrence systems. It runs in a northerly direction through the city of Rome and reaches the northern boundary of the county where it turns toward the east and later again toward the southeast, passing out of the county north of West Canada creek.

The southern towns of Sangerfield and Bridgewater are drained by branches of the Chenango and Unadilla rivers. These traverse broad valleys occupied by swamps that belong to the Susquehanna watershed and are drained by that river system.

The western part of the county from Augusta to the northern boundary is drained by Wood, Oneida and Fish creeks with their branches. These are tributary to Oneida lake and form part of the St. Lawrence system. The northeastern part of the county is drained by the Black river, also tributary to the St. Lawrence.

The greater part of the county is drained by the Mohawk and its branches. These extend southward to the boundaries of the southern towns and northward to the boundary of the county. It drains all of the great central portion of the county and is the principal river of this section.

THE ORIGINAL FOREST

This entire region was originally covered with a dense forest growth. The northern hardwoods more or less mixed with conifers covered the greater portion, especially the hill regions of the north and south. The hemlock was a common tree in mixture, and on the higher elevations occupied the ground to the exclusion of everything else. White pine was also found throughout the county,



Photo by J. W. Stephen.

Young Hardwood Forest in Need of Thinning. The useless and defective trees should be removed. The fire wood which will be obtained will nearly pay the cost of removal. Compare this picture with the one following.



A Growth of Poplar from Which the Merchantable Material Over Six Inches in Diameter Has Been Removed. On this land successive crops are produced every 8 years.

Photo by J. W. Stephen.



Photo by J. W. Stephen.

A Mature Poplar Stand.

but was more common in the swamps of the south than on the hills. It became the principal tree of the light sandy regions of the north-east, where it was found in mixture with spruce and balsam. The original forest types of the county, therefore, were the northern hardwoods, occupying three-fourths of the entire area, with hemlock in sufficient quantity to give a distinctive character to the mixture; the swamp types, containing pine in addition to the cedar, balsam, black ash, red maple and elm more commonly found in such situations; and the mixed pine types where the principal specie was the white pine.

THE PRESENT FOREST

THE HARDWOOD TYPE

The northern hardwood type has given place to the scattered woodlot type and cultivated land. The desire to secure land for agricultural purposes has been carried altogether too far and many areas were denuded that are better fitted for a forest crop than for anything else. This land today yields at best a very poor return and is largely only pasture of poor quality. Some sections of the county have more of this land than others. This is especially true of the higher hill sections where a large per cent of the land should have been kept forested. There is probably about 10 per cent of the original hardwood region that is still forested and an additional 30 per cent from which the forest was removed that ought to be replanted and kept under forest conditions.

Past Management.—The wooded areas are exceedingly small, averaging from two to twenty acres in extent and are in a very poor condition. Dairying is the chief industry throughout this region and other interests have often been sacrificed to contribute to its success. For that reason we find that almost every wooded area has been pastured. All pastured woodlots show an entire absence of thrifty young growth. The species found are largely beech and maple. The trees are scattering, low branching, slow of growth, and wanting in the qualities that are essential to proper timber development. They lack also sufficient density to serve as a protection against winds and in preventing erosion. They are a damage rather than a benefit to the pasture because they decrease

the amount of grass produced and it lacks in nutrition. The only useful purpose they serve is to afford shade for the stock and a possible source of fuel for the future. The woodlot is often found on the portion of the farm that is unfitted for cultivation and should always be forested, but the past treatment has been such that from its present condition it makes future successful development impossible. It will be more practical to remove the trees that now occupy the ground and renew the forest by planting.

Probably not more than 5 per cent of this woodland in the agricultural communities has not been pastured, but this is sufficient to show the beneficial results of such treatment. They stand in striking contrast to the pastured woodlots. There is a dense stand of young timber with tall tapering boles. Although the general type is maple and beech, yet there is a sufficient number of other species intermingled to give a distinct modification to the type. The species in order of numbers are maple, beech, basswood, ironwood, ash, elm, butternut, hickory and hemlock. On higher elevations hemlock would occupy a position nearer the front rank and in some cases, stand at the head.

Future Management.—These stands have reached a stage where they should be thinned. Culls remaining from the original forest may still be found. These should be removed along with the weed trees such as ironwood, blue beech and the inferior trees of other species. If it should be necessary to thin still more, remove the beech. Favor the more valuable species at all times. The material removed can be used for fuel or for some other purpose and will more than repay the cost of removal. The trees that are left will make more rapid growth and mature earlier as a result of the improved conditions.

The object of the owner often determines the species to be favored. If the woodlot is to be used for the production of sugar, the sugar maple would be favored and other species removed whenever their removal would benefit the development of the maples.

Much of the original hardwood region is particularly well adapted to the growth of basswood. Many of the unpastured second growth forests contain a large percentage of this valuable species of both



A Mixed Growth of Basswood and Other Trees. Thinning necessary in order to remove the poor trees and give the valuable basswood better opportunity for growth.

Photo by J. W. Stephen.

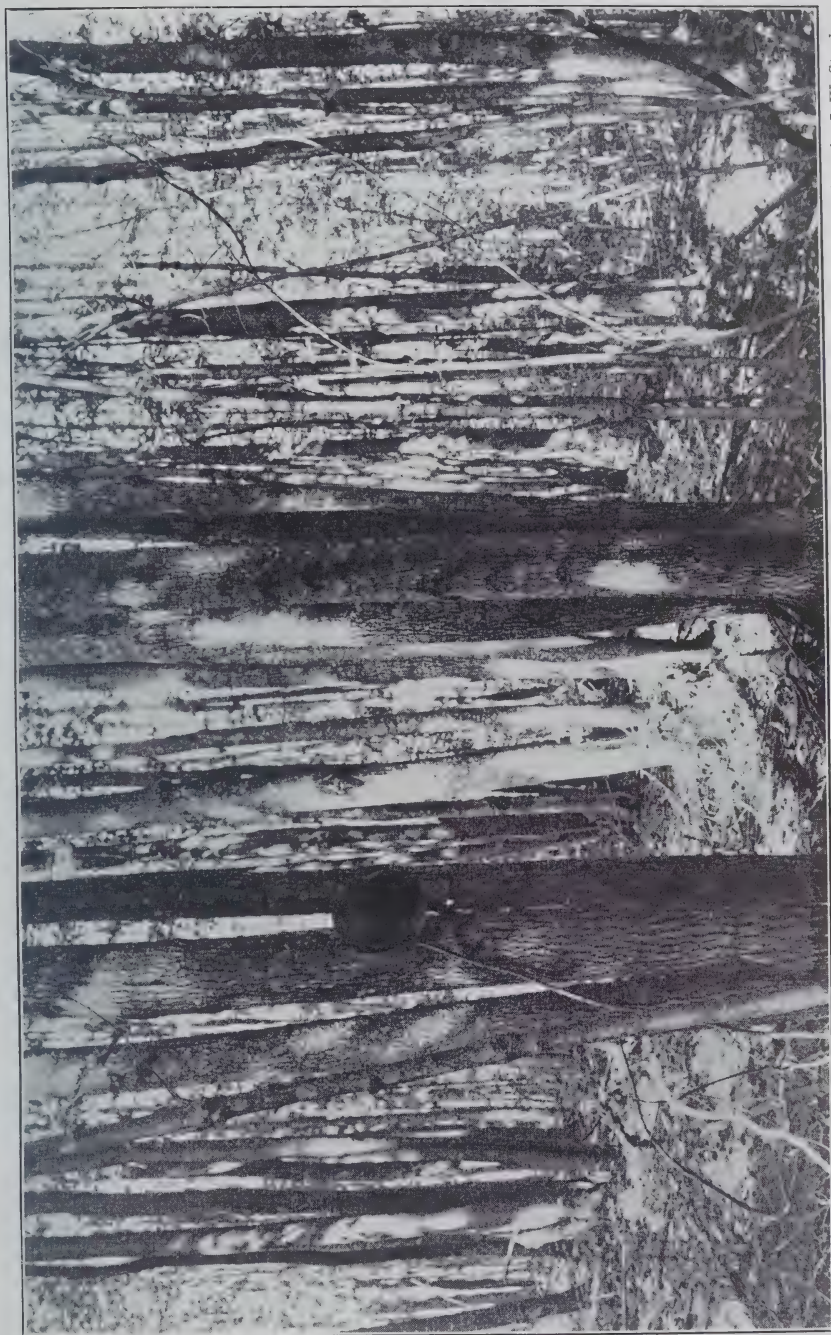


Photo by J. W. Stephen.

An Almost Pure Forest of Basswood. The trees have grown from sprouts and thinning is necessary.



Fire Injured Poplars That Should Be Utilized. In less than five years after fire no trees will be left standing.
Photo by J. W. Stephen.

seedling and coppice growth. Some of these stands should be thinned at once. The trees are from 6 to 12 inches in diameter and 30 feet and more to the first limb. They require abundant light for their best development and by removing the inferior species in mixture this can be obtained. The resulting stand will be largely basswood with white ash, hickory and cherry in mixture. The undergrowth of small bushes and trees should be retained to protect the ground cover. A forest of this composition can be kept for a sprout forest if desired and when mature should be cut clean, the stumps cut low with a saw, and on a slant to prevent decay. Future crops will be provided for by reproduction from the stumps.

The many desirable qualities of the basswood and its many uses make a wide market for this timber at excellent prices. When you consider that along with these qualities, it is a rapid grower, prolific seeder, and reproduces abundantly by means of sprouts, it makes an ideal tree for propagation.

Opportunities for the Practice of Forestry.—The past management of this entire hardwood region has not taken into consideration the perpetuation of the forest. The few examples of desirable second growth forests are perhaps the result of circumstances more often than intention. There are exceptions, however, to this rule and there is a growing interest among landowners in general looking toward the establishment of forested areas for the growing of timber. There is a great opportunity for this work not only in making the most of the material that is now on the ground and wherever possible placing the present woodlot on a productive basis, but also by reforesting areas, that are now denuded, by the planting of species adapted to the locality. About one-third of this region is better fitted for raising timber than for any other purpose. This offers the only opportunity for giving this land a permanent value. If it were again forested, it would not only give value to the lands forested, but also enhance the value of the remaining lands for agricultural purposes. Throughout this region the native hardwoods will do well, but I believe better results will be obtained by planting Norway spruce. The different species of pine should do well in most situations, but I would favor the planting of spruce.

THE SWAMP TYPE

The swamp type is confined chiefly to low-lying valleys containing deposits of muck. The largest swamp region is found in southern Sangerfield, where it occupies a rather broad valley, probably the basin of a prehistoric lake. The principal species are cedar, pine, balsam, hemlock, black ash, red maple and elm. The reproduction of the cedar and other conifers is being gradually superseded by the reproduction of deciduous species and it appears to be undergoing transition from an evergreen to a deciduous forest.

Past Management.—These swamp lands have been used for the production of ties and poles. They have been especially important in this section for the production of the small poles used in the neighboring hop fields. These are cut for this purpose when they reach four or five inches in diameter and are of so great importance to the industry that farmers for miles around each own a few acres of swamp land.

Future Management.—The area of these swamps is being gradually encroached upon for agricultural purposes. These lowlands when properly drained make ideal sites for hop raising, one of the leading industries of this section. They will continue to produce poles until by draining they are made more valuable for the production of agricultural crops. They will then cease to be forested. It is only a question of time until all such lands are drained and used for agriculture.

THE MIXED PINE TYPE

The mixed pine type originally occupied large areas in the northern part of the county. The original forest was chiefly pine with hemlock, some hardwoods, and in some sections spruce in mixture. The soil of this region is principally sand and the ultimate forest will be the mixed pine type, no matter what the present composition of the forest may be. Wherever fire has occurred the poplar occupies a large part of the ground and is an important species that must be considered in the future management.

Past Management.—There are a few areas that still contain some of the original forest, but these are very limited in extent. The



Photo by J. W. Stephen.

Natural Reproduction of White Cedar Near Waterville, N. Y.



Photo by J. W. Stephen.

Natural Reproduction of Poplar. This tract has produced 4 cords per acre in a period of 8 years.

greater part of all this region has been lumbered. Some of it is being lumbered at the present time for the third cutting. They are gathering the material that at previous cuttings was not of sufficient value to pay for exploiting. Whatever is left after the present operation will be of very little value for any purpose. Much of this region has been burned and some of it has been burned again and again. The original type has disappeared, not even seed trees being left to reseed the ground. Lands that have been burned as thoroughly as these have been are usually seeded by some species like the poplar that on account of the lightness of its seeds scatters on the winds to great distances. This is true in this case and we find much of these lands covered with the poplar type. The trees found associated with the poplar are the pin cherry, paper birch and maple, with spruce and pine coming in wherever there are seed trees.

Future Management.—The poplar is a rapid growing tree, reproduces from seeds and root sprouts and reaches maturity at an early age. It is in good demand at pulp and excelsior mills and should be cut at maturity. It is easily injured by fire and whenever this occurs it should be cut in order to utilize the material before it decays. One of the illustrations shows a region through which fire swept a number of years ago. Most of the stand has already blown down and the trees that are left will all be down within another year. Such material is worth \$6 per cord at the mill and unless it is utilized it becomes a total loss.

An accompanying illustration shows a stand that is ready for cutting. Much of it is near maturity and it will yield to-day as much as it ever will. If it is left uncut for a few years, much of it will blow down and the reproduction that follows will be less than occurs after cutting.

Another illustration shows a stand that has been cut recently. It was cut to a diameter limit of 6 inches. This is the second cutting that has been made on this same ground in the past eight years and an equal amount can be removed in another eight years. Four cords to the acre were taken each time, so that it is possible to cut over poplar ground three times in twenty-five years and obtain one-half cord or better per year and continue this indefinitely. The skidding

should be done early in the spring. The young growth that is left should not be injured but the soil itself may be broken up as much as is necessary without danger of injury to the future crop. The roots that are injured in the process will send up new shoots and the exposed soil will allow for the germination of seedlings. Intentional breaking up of the soil and cutting of the roots would probably result in a great increase in the number of new shoots and consequent increase in future crops. In all of this region the spruce and pine are coming in wherever there are seed trees and in handling such land for poplar this fact should be borne in mind and the young growth of these species should be favored so that these lands may return to the original type as soon as possible.

The areas that still contain merchantable timber of the original type should be protected from fire, and if lumbered, should be cut to a certain diameter limit so that there would be enough left on the ground to reseed the ground for future crops.

Opportunities for the Practice of Forestry.—There is an excellent opportunity for the practice of forestry throughout this region. The land is adapted to the growing of timber rather than to the production of other crops. Much of it is covered with poplar and a poor quality of hardwood growth that will never amount to much. There are large areas that have little growth of any kind and these should be planted with pines. The seed trees are so scarce throughout this region that it would take several generations of self seeding before a stand of sufficient density to make desirable timber would be obtained. Such a stand can be obtained at once by planting. Reforesting is the only way to give such lands premanent value and the quicker this is done the better for all.

OWNERSHIP AND VALUES

The majority of the residents on the farms of the county are the owners of the land. There are, however, a great many tenants. This is especially true in the hill region where much of the land is held by nonresidents, the descendents of the early settlers. The population is cosmopolitan in its character. There are a goodly



Photo by J. W. Stephen.
The Comparison of Natural Reproduction on Pastured and Unpastured Land. To the right of the fence pasturing has been prohibited, and there is an excellent reproduction, while on the left pasturing has been permitted and no young growth is to be found.

number left of the original settlers but most of the renters and recent purchasers of land are later arrivals. German, Polish, Irish and Italian names are common.

VALUE AND TAX RATES

The prices of farm property vary according to location and improvements. Good farm land will bring as high as \$100.00 per acre, while cut over lands that have no value for agriculture are assessed as low as \$1 per acre. Many of the rough hill farms are assessed below \$10 per acre. The assessed valuation is probably about two-thirds of the real value, although in many cases it would be hard to make a quick sale at the assessed valuation.

The tax rate varies greatly in the different towns. It is as low as \$3.71 per thousand in some towns and as high as \$25.67 in others.

THE LUMBER INDUSTRY

The lumber industry in Oneida county is at rather a low ebb because of the scarcity of timber. There are, however, mills of different grades found in almost every section of the county. Some of these are portable mills. Most mills of the county do more or less custom sawing, charging about \$3 per M. for soft woods and \$3.50 per M. for hardwoods. They pay an average of \$18 per M. for hemlock and elm and \$20 for maple and basswood delivered at the mills throughout the southern part of the county. Prices average slightly lower in the northern part. The price on the stump varies with the location of the timber and the difficulties encountered in getting it to the mill yard.

The amount cut by the different mills is decreasing rapidly on account of the growing scarcity of logs. The mill yards show that more complete utilization is being accomplished, because many of the logs are of a poorer quality than would have been seen in the yards a few years ago.

The timber is manufactured into a great variety of material. There are mills for the manufacture of the different grades of lumber and of lath, heading and shingles. There are mills also for the manufacture of some special product, e.g., pulp, excelsior, chairs, furniture, notions and brooms.

TRANSPORTATION FACILITIES

Oneida county is well situated for carrying on the lumber industry. It has numerous streams for the cheap transportation of the raw material. It has railroads and canals that reach almost every section of the county and that bring all parts in touch with the best of markets. It has unsurpassed advantages for manufacturing industries. Those already established that require timber for the basis of their product could use far more than the present production with unlimited opportunity for expansion to make use of all the material that it is possible to grow on the natural timber lands of the county.

CONCLUSIONS

Oneida county occupies an important position in regard to the drainage systems of the State. It is the source of streams that are the headwaters of the Susquehanna, that belong to the watershed of the St. Lawrence, and what is of still greater importance, contains much of the drainage basin of the Mohawk. These streams are all of great importance to the State as a source of power for its manufacturing industries. The canal system is dependent on a continuous and uniform supply of water from this particular section. Any plan for the conservation of our resources must take into consideration the development of this region especially in its relation to a water supply.

At least one-third of the entire county is better fitted for the production of timber than for any other purpose. Not more than ten per cent could be called forested at the present time and some of that is located on agricultural land. It is safe to say that 30 per cent of the entire area of the county is land that will never have a permanent value approximating its potential value until it is covered with a properly regulated forest. This would not only give these lands a permanent value, but it would increase the net income per acre, protect the watersheds from erosion, regulate the flow of springs and streams, decrease the dangers from drouth, and increase the production capacity of the remaining lands for agriculture.



Photo by J. W. Stephen.

Pulp Wood in West Canada Creek Near Hinckley.



Photo by J. W. Stephen.

A Dense Border Around the Farm Woodlot Which Prevents the Wind from Blowing Away the Litter and Insures Favorable Forest Conditions.

Much of this region is adapted to the growth of conifers. Large areas of contiguous territory are found in the northern half of the county that has a sandy soil and that offers unsurpassed opportunity for the production of conifers. This territory should be planted with the various species of pine also spruce.

The remainder of the county contains much land that should be forested though occurring in smaller parcels. It is also adapted to the growth of conifers but I would favor the planting of Norway spruce in preference to the pines.

These lands are also adapted to the production of deciduous species. The basswood and maple particularly will pay to propagate and favor wherever possible, the maple as a basis for the sugar industry and the basswood for its valuable timber and also as a source for the supply of honey.

Enough examples are found of woodlots that have been protected from grazing to show that areas that are properly protected after being cut will reproduce a valuable crop of desirable species. A little care in thinning on the part of the owner will produce a very valuable timber property.

I believe there is a great future for the farms of Oneida county in planting these denuded areas and in protecting the lands already forested, so that all lands that are better adapted for the growth of timber than for any other purpose, may have a permanent value and return an income commensurate with their possibilities.

SPECIES IN ONEIDA COUNTY

<i>Pinus strobus</i>	White pine
<i>Larix laricina</i>	Tamarack
<i>Picea rubens</i>	Red spruce
<i>Tsuga canadensis</i>	Hemlock
<i>Abies balsamea</i>	Balsam fir
<i>Thuja occidentalis</i>	Arborvitae
<i>Juniperus virginiana</i>	Red juniper
<i>Juglans cinerea</i>	Butternut
<i>Juglans nigra</i>	Black walnut
<i>Hicoria minima</i>	Bitternut hickory

<i>Hicoria alba</i>	Mockernut
<i>Salix nigra</i>	Black willow
<i>Populus tremuloides</i>	Aspen
<i>Populus grandidentata</i>	Large-tooth aspen
<i>Populus balsamifera</i>	Balm of Gilead
<i>Populus deltoides</i>	Common cottonwood
<i>Betula papyrifera</i>	Paper birch
<i>Betula lutea</i>	Yellow birch
<i>Ostrya virginiana</i>	Hornbeam
<i>Carpinus caroliniana</i>	Blue beech
<i>Fagus atropunicea</i>	Beech
<i>Castanea dentata</i>	Chestnut
<i>Quercus alba</i>	White oak
<i>Quercus macrocarpa</i>	Burr oak
<i>Quercus rubra</i>	Red oak
<i>Quercus velutina</i>	Yellow oak
<i>Ulmus pubescens</i>	Slippery elm
<i>Ulmus americana</i>	White elm
<i>Ulmus racemosa</i>	Cork elm
<i>Liriodendron tulipifera</i>	Yellow poplar
<i>Prunus Pennsylvanica</i>	Wild red cherry
<i>Prunus serotina</i>	Black cherry
<i>Gleditsia tricanthos</i>	Honey locust
<i>Robinia pseudacacia</i>	Locust
<i>Acer pennsylvanicum</i>	Striped maple
<i>Acer saccharum</i>	Sugar maple
<i>Acer saccharinum</i>	Silver maple
<i>Acer rubrum</i>	Red maple
<i>Acer negando</i>	Box elder
<i>Tilia americana</i>	Basswood
<i>Fraxinus nigra</i>	Black ash
<i>Fraxinus americana</i>	White ash
<i>Catalpa catalpa</i>	Common catalpa
<i>Catalpa speciosa</i>	Hardy catalpa

LANDS CONVEYED TO THE STATE DURING THE YEAR ENDING DECEMBER 31, 1910

ADIRONDACK PARK		Acres
<i>Essex County:</i>		
Old Military Tract, Twp. 11, Lot 199, N. W. $\frac{1}{4}$, except 20 acres N. E. corner from P. J. Marsh..		30
<i>Hamilton County:</i>		
Totten & Crossfield Purchase, Lots 10, 11 and 12. Allowance of acreage deducted from Certf. 298 at time of issuance. A sworn map of the land in question was filed with the Comptroller Oct. 30, 1909 and G. N. Ostrander allowed pay for this additional amount of acreage. Same should now be added to area of Park.....		134
Benson Township, Lot 111, the und. $\frac{1}{4}$ of the East $\frac{1}{2}$ and the undivided $\frac{1}{2}$ of the West $\frac{1}{2}$, Hiram Darling		60
CATSKILL PARK		
<i>Greene County:</i>		
Hardenburg Patent, Great Lot 23, Lot No. 87, from Albert A. Lewis and wife.....		185.5
Hardenburg Patent, Great Lot 25, Lot No. 86 from Stanley Vosburg & ors.....		776.8
<i>Ulster County:</i>		
Hardenburg Patent, Town of Hardenburg, Great Lot 6, from Arthur Jones and wife, Lot 248, Robertson Tract		40
Hardenburg Patent, Great Lot 7, Livingston Tract. Town of Shandaken, part of Lot 3.....		40.6
also, part of Lot 3.....		213.86
Both conveyed by Miles Parker and wife.		

**LANDS CONTRACTED FOR BY THE STATE BUT NOT
YET CONVEYED, DECEMBER 31, 1910**

ADIRONDACK PARK

ESSEX COUNTY

HOFFMAN TOWNSHIP

Town	Lot	From whom bought	Acres
Schroon.....	13	W. $\frac{1}{2}$. Arthur E. Warren..... (See below for balance of Essex county.)	125
		HERKIMER COUNTY. ADGATE'S EASTERN TRACT. MINUSE (J. H.) TRACT.	
Wilmurt.....	28	N. $\frac{1}{2}$, March 3, 1909, Harry J. Tighe..	50
		ESSEX COUNTY. PARADOX TRACT.	
Schroon.....	58	June, 1908, Geo. N. Ostrander.....	160
		BRANT LAKE TRACT.	
Horicon.....	197	April, 1908, Geo. N. Ostrander.....	89
		HAGUE TRACT.	
Ticonderoga.....	25	April, 1908, G. N. Ostrander.....	209.4
		HOFFMAN TOWNSHIP.	
Schroon.....	17	N. $\frac{1}{2}$, June, 1908, G. N. Ostrander.....	125
do	24	N. $\frac{1}{2}$, do do	125
		TOTTEN AND CROSSFIELD, TOWNSHIP 25, BAILEY'S PATENT.	
Schroon.....	13	April, 1908, Geo. N. Ostrander.....	100
		TRACT WEST OF ROAD PATENT.	
Schroon.....	144	April, 1908, G. N. Ostrander.....	86
do	145	do do	112.90

LANDS CONTRACTED FOR BY THE STATE BUT NOT YET CONVEYED, DECEMBER 31, 1910

CATSKILL PARK

DELAWARE COUNTY

Town	Lot	Date and from whom bought	Acres
Middletown	12 }	HARDENBURGH PATENT. GREAT LOTS 7 AND 10. (<i>Darling's First Survey.</i>) Sept., 1910, D. W. Karshner & Son,	320
do	13 }	west side of Mill Brook stream.....	
Jewett and Windham. ....	....	GREENE COUNTY. HARDENBURGH PATENT. GREAT LOT 22. Aug. 19, 1908, C. J. Vining. Known as the "Conley lot." Part of lot 43, known as Tomelson and Day tract..	144
Hunter.....	128	GREAT LOT 25. Wm. F. Cooper.....	250
Hunter.....	19 }	GREAT LOT 26 Nov. 18, 1908, E. P. Simmons (estate of Christian Baehr) sometimes re-	400
	20 }	ferred to as W. B. Simmons.....	
	21 }		
	24 }		
	25 }	See Ulster county for complete de-	
Hunter.....	....	scription. Nov. 2, 1908, First National Bank, Saugerties, with quarry privileges for five years.....	1,500
Cairo and Catskill...	18 }	STATE LAND TRACT. Aug. 14, 1908, H. B. Whitcomb north-	800
	19 }	erly portions of lots 18 and 19 and adjoining on the west the lands of Catskill Mountain House and con-	
		taining the head waters of Winter Clove and Bear Back creeks.....	
Cairo.....	35	N. pt. J. Fillmore Scott.....	112.48
Windham.....	51	and 52 part, July 1, 1909, Orwell G. McGlashen. Bounded north by top of mountain, east by lands of Norman Newcomb, south by lots 59 and 60, west by lands of Geo. Ruland, about	600

CATSKILL PARK—(Continued)

GREENE COUNTY—(Continued)

Town	Lot	Date and from whom bought	Acres
Windham.....	52	STATE LAND TRACT—(Continued). (Probably during 1908.) Wm. Phelps, Jr. Cutting has been done which the Department knows about. See cor- respondence on file.	1,256
	53		
	61		
	62		
	69		
do	78	John Phelps, Feb. 11, 1909.....	150
SULLIVAN COUNTY. HARDENBURG PATENT. GREAT LOT 5.			
Neversink.....	183	Feb. 8, 1910, Geo. E. Rice, agent, Parkville, N. Y.....	2,267 $\frac{3}{4}$
do	184		
do	185		
do	186		
do	187		
do	224		
do	226		
do	242		
do	243		
do	244		
do	246		
do	247		
do	248		
do & Rockland	253		
do do	257		
do do	258		
do	260		
do	265		
?	293		
?	488		
?	489		
?	494		
Neversink.....	499	June 10, 1908, Carrie King Hammond. Bought with privilege of removing logs and timber already cut on said premises. (See letter of acceptance June 10, 1908, Neile F. Towner.)	1,245 $\frac{1}{4}$
do	500		
Rockland.....	239		
Neversink.....	*241		
do	245		
do & Rockland	251		
do	478		
do	479		

* Exc. 50a. S. W. cor.

CATSKILL PARK—(*Continued*)

ULSTER COUNTY

Town	Lot	Date and from whom bought	Acres
HARDENBURGH PATENT. GREAT LOT 6, DIVISION 1. Denning Tract.			
Denning.....	31	Exc. 10 acres from south corner of lot, April 25, 1907, Jas. B. Smith (Nancy P. Childs).....	150
GREAT LOT 6, DIVISION 2. Connecticut Tract.			
Hardenburgh.....	51	June 10, 1908, Stoddard Hammond or Carrie King Hammond.....	2,439.88
Denning.....	65 E. ½		
Hardenburgh.....	71	See Sullivan county for balance of offer.	
Denning.....	72		
do	73		
do	79		
do	80		
do	86		
do	87		
do	88		
do	92		
do	94		
do	95		
do	96		
do	99		
do	100		
do	101		
do	102		
do	107		
do	115		
do	116		
do	117		
GREAT LOT 6, DIVISION 3. Robinson Tract.			
Hardenburgh.....	240	March 4, 1909, E. Alley (Second Na- tional Bank, Cortland).....	779
	241		
	242		
	243		
	245		
	246		

CATSKILL PARK—(Continued)

ULSTER COUNTY — (Continued)

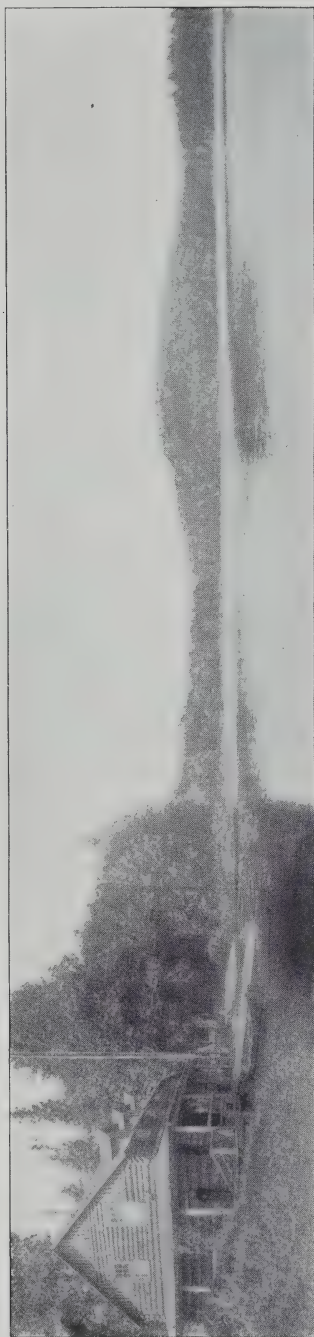
Town	Lot	Date and from whom bought	Acres
GREAT LOT 8. <i>Duer Tract.</i>			
Shandaken.....	37	July 6, 1909, Chas. W. Gallae, Jr., Arthur E. Rose, attorney.	103.9
do	38		112
do	45		119.5
do	46		118.6
GREAT LOT 8. <i>Allotment North of Beaver River.</i>			
Shandaken.....	2	Nov. 11, 1908, Winne estate.....	145
do	3	Lies in a basin facing the west.....	100
do	4	Joins on north by Simpson lot; east by Hudlet lot. Diagram on file with offer showing exact location.	108
GREAT LOT 8, DIVISION 6. <i>Lausette and Bouchard.</i>			
Shandaken.....	10	Aug. 10, 1908, Elbert A. Harrington.. On west slope of mountain east of Birch creek.	100
GREAT LOT 8. <i>Johanna Livingston or Sherwood Tract.</i>			
Shandaken.....	23	Mary L. Newman.....	190.2
GREAT LOT 26, SUBDIVISION 3, WESTERN PART.			
Woodstock.....	.....	Dec. 16, 1908, S. J. Adams..... On each slope of Catskill range and from the foot to the Greene county line and being the west part of sub- division 3.	555
GREAT LOT 26, SUBDIVISIONS 6 & 7.			
Woodstock.....	.....	November, 1908, E. P. Simmons (Baehr estate. Sometimes referred to as W. B. Simmons offer). “ Beg. at N. W. cor. of a tract of land heretofore sold by said Mott to John Kiersted, Jr., and others; thence along a line of marked trees north 56 deg. 30 min. west 200 ch. to a sapling marked and cornered and stones around it; thence south 33 deg. 30	1,600

CATSKILL PARK—(*Concluded*)ULSTER COUNTY — (*Continued*)

Town	Lot	Date and from whom bought	Acres
		SUBDIVISIONS 6 & 7— (<i>Continued</i>) min. west 120 ch. to a tree near a ledge of rocks with stones around it; thence along the south bounds thereof south 56 deg. 30 min. east 200 ch. to the southwest cor. of said tract of land heretofore sold to John Kiersted, Jr., and others, and thence along said tract north 33 deg. 30 min. east 120 ch. to the place of beginning, containing 2,400 acres of land; excepting and reserving in the conveyance lots 47, 44, 16 and 29 (1,600 acres in Ulster county and 400 acres in Greene county).	
Saugerties & Woodstock.....	.....	GREAT LOT 26, SUBDIVISIONS 6 AND 7. Nov. 2, 1908, First National Bank (1,500 acres in Greene county.)	500
Olive.....	7	TOWN OF OLIVE. April, 1906, R. C. H. Thompson.....	75
Rochester.....	16	ROCHESTER PATENT. GROTE TRANSPORT.	150
do	18	April, 1906, R. C. H. Thompson.....	91.5
do	19		47

DEPARTMENT OF FISH CULTURE

DR. TARLETON H. BEAN, *State Fish Culturist*



Twitchell Lake, N. Y. Famous Trout Water.

Photo Meldrum, Utica.

REPORT OF THE STATE FISH CULTURIST

Hon. H. LEROY AUSTIN, *Forest, Fish and Game Commissioner:*

Sir.—I have the honor to present herewith a report upon the fish cultural work for the calendar year 1910.

This contains the yearly statements of the foremen of the nine stations now operated by the State, together with additional notes based upon inspection trips, notes upon the fishes and other water animals of New York with special reference to their habits and reproduction, statistical data giving comparisons of work accomplished during the last four years, and such other items as seem to be of public interest and value.

A brief sketch of the fish wealth of New York forms part of this report. This account is based upon the investigations of the earlier writers upon the fishes of the State, the investigations of the U. S. Bureau of Fisheries, special papers by university men and other students, and the personal observations of the writer. It is unfortunate, but true, that the life of the inland lakes of New York, numerous and important though they are, is as little known as that of some of our remote possessions. New York ranks among the greatest of the States in the value of its fisheries, and its waters contain undeveloped resources of unusual importance. We know little more than the names and spawning seasons of our common fishes. The interrelation of species in their effects one upon the other is almost a sealed book to us. In fish culture the State is occupied with only about thirty species, and these are under observation for the most part at the spawning season only. What is going on in the open waters of our streams and upon the bottoms of our lakes is little understood, and yet it is of vital importance to the success of our work. The State ought to devote more time and money to the study of its natural aquatic resources. Such investigations would yield unexpected and most gratify-

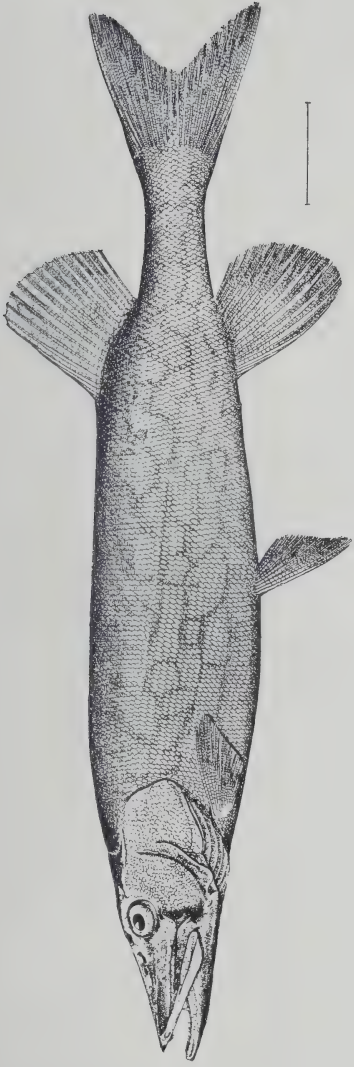
ing returns. The work at the stations requires the services of studious men who are devoted to the interests of fish culture. It cannot be done by time servers. New York should easily take first rank in the results of its fish cultural operations; but it is really not above the second rank. Pennsylvania distributes about one billion of fish and other water animals annually. It has an independent Department of Fisheries, and its management is under the control of a single commissioner. That state has a serviceable steamer on Lake Erie by means of which eggs of Whitefish, Lake Herring and Lake Trout are collected in large numbers. New York owns no boats for its work with the fishes, and must depend upon such aid as an allied department of the Commission can grant, or upon rented service. It is time that the importance of the fisheries to the general public as well as to the angler was fully recognized and acknowledged.

New York is wonderfully diversified in its boundary lines and elevations, and has an extensive water area. Its principal drainage systems are the Great Lakes, Lake Champlain, the St. Lawrence, the Ohio Basin, the Susquehanna, the Delaware, the Hudson with adjacent small streams such as the Passaic, Hackensack, Wallkill and Bronx, and the large inland lakes, many of which communicate with Lake Ontario.

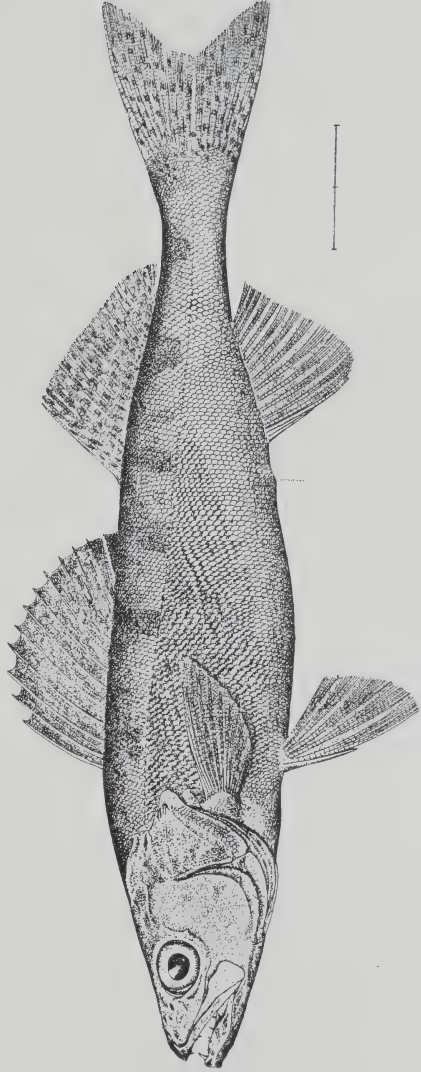
Long Island is richer in fish than the rest of the State, but its species are chiefly marine. There are 217 marine forms of fish life around Long Island and only 27 fresh water species in the streams and lakes, of which 13 or more have been introduced within the last century or two. In the waters of the State there are now catalogued between 375 and 400 species.

In 1842, Dr. DeKay knew only the Yellow Perch, the Roach, Banded Pickerel and Brook Trout from Long Island. Dr. Mitchill transferred Yellow Perch from Lake Ronkonkoma to Success Pond, a distance of 40 miles, in 1790.

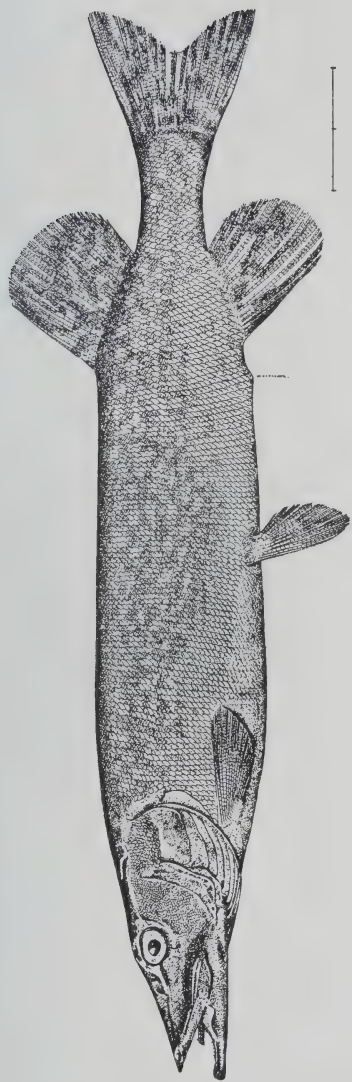
Some of our most important fishes run up periodically from the sea into the fresh waters for the purpose of spawning. Among these are the Sea Lamprey, two species of Sturgeon, the Eel, the



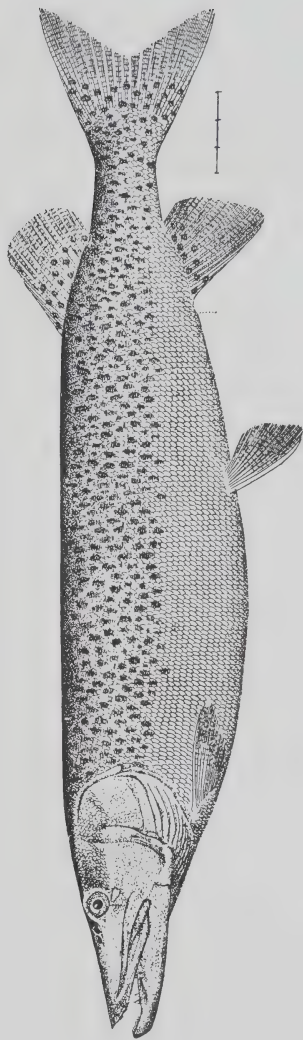
Pickerel, *Esox reiculatus*. Le Sueur.



Pike perch, *Stizostedion vitreum* (Mitchill).



Pike, *Esox lucius*, L.



Maskalonge, *Esox masquinongy* (Mitchill).



Fishway, Dam in Grasse River, Canton, N. Y.

Hickory Shad, two species of River Herring, the Shad, the Quin-nat and Atlantic Salmons, the Steel Head Trout, Rainbow Trout, Smelt, two species of Sticklebacks, Striped Bass and the White Perch.

The Silver Gar, Bluefish, Crab Eater, Naked Goby, Tomcod and Hogchoker, or Sole, are marine species which ascend into fresh water.

The following fishes have been introduced into the State: Tench, Ide, Goldfish, Carp, Quinnat Salmon, Atlantic Salmon, Land Locked Salmon, Black Spotted Trout, Steel Head Trout, Brown Trout, Loch Leven Trout, Rainbow Trout, Swiss Lake Trout, Saibling and Golden Trout.

The fishes represent 99 families of which the most important, from a commercial standpoint, or for angling purposes are the Catfishes, Minnows, Herrings, Salmon, Pikes, Killyfishes, Mack-erels, Pompanos, Sunfishes, Perches, Sea Basses, Weakfish, Cod-fishes and Flounders.

The most important commercial fishery in the State is based, of course, upon the Shellfish including the Oysters, Clams, Lobsters, Crabs, etc.

Fish culture in New York ranks high in comparison with that of the other States. The total output of the hatcheries is second, perhaps, only to that of Pennsylvania. The State is handicapped to a great extent by the fact that the water supply at nearly all of its stations is a gravity supply only. For extensive work on a large scale and in a small space, greater head of water is required than is now available. Some of the hatcheries are not located in the most advantageous places, and the supply of spring water is not always sufficient to carry young trout to the fingerling age with safety in dry, hot seasons.

Many of the serious diseases which cause fish mortality are clearly traceable to pollution by sewage or other poisonous drain-age into the stream from which hatchery water is taken. The best water for practical purposes is that from artesian wells at several of the stations. This water is not polluted, and it seldom contains any vegetable or animal parasites from which serious

epidemics might arise. Several of the stations which suffered most severely from spot disease, boil disease, goitre, protozoan swellings, etc., have been improving steadily for several years, and have practically been rehabilitated. It would be of vital importance to our work if we had a compendium of the papers and books relating to fish diseases, many of which are in foreign languages. We have not in this country devoted as much time and study to the diseases of fish as we should have done, and the result is disastrous when epidemics arise, as they are liable to occur at the most unexpected times and places. Nature has placed a great many checks upon the overproduction of trout in the form of parasites and enemies which attack eggs and young and even adult fish. Many of these natural difficulties have been met and overcome; but there still remains the serious investigation of the effects of water pollution and of vegetable and animal parasites upon the increase of trout and other game fish in our streams and lakes. The sea fish are less liable to destruction by disease and parasites. A great field for advancement is open to the Department in marine work. If this were properly utilized New York would soon and easily take first rank among the States.

The stations almost without exception are growing in efficiency from year to year. The number of applications filed is steadily increasing, and the output of fish is greater each year. A comparison of the yield for a number of years past, including 1910, forms part of this report. There should be some readjustment of the annual maintenance funds of the various hatcheries, based upon the results of work accomplished. Most of our employees are underpaid, and should receive an increase of wages. The duties of most of the men at the stations are onerous, and the hours are long. It seems unjust to pay even a laborer of the intelligence needed at our hatcheries less than \$2 per day. The foremen of stations, especially those who, by reason of long service and faithful discharge of their duties have earned commendation, should have \$125 per month, which is the amount paid to superintendents in the Federal Bureau of Fisheries. Such a just policy would result in rapid and marked improvement in the service.

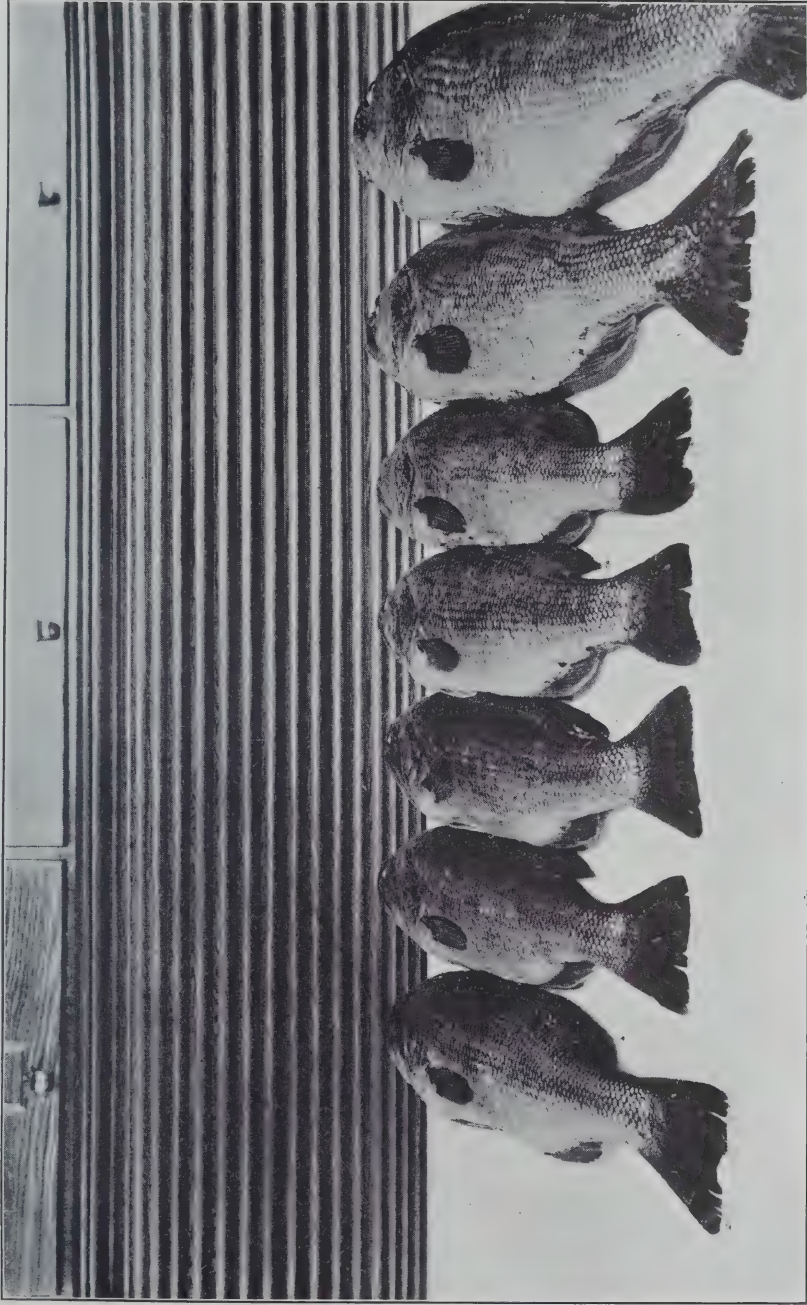


Photo by Rodney Gooding.

Large Mouth Black Bass, Burden Lake.



By J. D. Fouquet, Sept., 1909.

Helgramite and Adult.

EXPLANATION OF PLATE.

The parent of the "Helgramite" is not a true dragonfly, but an insect allied thereto, with dark wings, a large body, and longer antennæ or feelers.

It flies slowly and mostly at night, and is attracted to electric lights. The parent-fly deposits a flat cluster of eggs attached to the under surface of a stone overhanging a stream. This cluster is about as large as a cent and is covered with a hard white substance that protects the eggs from the elements and from enemies.

Early in the fall or late summer, the tiny larvæ hatch from the eggs, drop into the stream, and catch whatever small insects they can for food.

It takes two or three years for one to become fully grown, and then they leave the stream, crawl under a stone or clod of earth, and transform into the mature insect.

The above is from the Smithsonian Institution, Washington, D. C., December 24, 1909.

Attention is respectfully called to the following matters which need prompt action:

The pollution of the sources of Spring creek in the village of Caledonia, and the diverting of water on State land for private uses should be stopped. The State will never be able to restore the Caledonia Hatchery to its original efficiency without absolute control of the bed of Spring creek above the hatchery grounds.

The lease of property for the Chautauqua Station should be renewed or else additional property, more suitable for hatchery purposes, should be acquired. The station is capable of doing excellent work with Trout, Lake Herring, Whitefish, Maskalonge, Black Bass and other valuable fish; but it must be enlarged and improved.

The Cold Spring Harbor Hatchery ought to have a larger annual maintenance fund and an auxiliary station or stations should be established at the eastern end of Long Island for work with important marine species. This station distributes more fish of value to the people for food than all the others combined, and at the same time it can handle all the Brook Trout eggs required by all the stations and bring them to the eyed stage.

The Delaware Hatchery is growing in efficiency, but it will probably never be able to do what is necessary in the way of furnishing trout for the region which it is intended to cover. It would be desirable to increase the State holdings by the purchase of a farm in the vicinity of the hatchery which has an extra large cold spring. It would be well also to acquire a dam site on the farm of Peter Sanford and, in fact, to buy all the property adjoining or touching Whortleberry Brook up to the head of the valley.

The Fulton Chain Station could be very much improved by introducing spring water at comparatively little expense for the purpose of rearing trout to fingerlings. The lake water now supplying the station becomes too warm in early summer to accomplish this desired object.

The Linlithgo Station will probably not be able to raise fingerling trout at any time because of the lack of spring water. It would be very desirable to produce fingerlings at the station for

distribution in Columbia and adjacent counties, and if a suitable spring can be located on the place it would be good policy to pump the water from the spring to the rearing races and ponds. The Black Bass and Calico Bass are thriving in the brood ponds, and the work with Shad and River Herring is growing constantly.

The Oneida Station badly needs a new hatchery in place of the present one which is antiquated and out of repair. A landing below the Scriba Creek bridge should be acquired, because at present the State boat can be reached only by crossing private property. A suitable launch for fish cultural work on Oneida Lake is one of the greatest necessities of the station. If this were supplied, the output of the hatchery could easily be increased 50 per cent and the boat would pay for itself in two seasons by saving launch hire.

The Pleasant Valley Hatchery has been redeemed by changing its water supply, and will soon forge to the front again in its yield of trout. The stream formerly supplying the hatchery and ponds was so badly polluted by drainage and sewage that it destroyed the efficiency of the station by causing serious diseases. The use of artesian and spring water has restored this property, and now it will grow in value from year to year. The collections of Lake Trout eggs in Keuka Lake for this station were reduced to the minimum through the depredations of the Yellow Perch and Suckers which devoured nearly all the eggs on every spawning bed in the lake. This discovery will probably account for our failure generally to obtain Lake Trout eggs in the large lakes which are known to contain plenty of trout.

In conclusion, permit me to recommend that the Department of Fish Culture be equipped with the force necessary to do its work up to the best standards. The result of this action cannot fail to be gratifying to the Commissioner and to the people.

Respectfully submitted,

TARLETON H. BEAN.

ALBANY, *December 31, 1910.*



Stocking Halfway Brook, Near Saranac Lake.

REPORTS FROM THE HATCHERIES

ADIRONDACK HATCHERY

To the Forest, Fish and Game Commission:

The work at this station during the past year has been successful. Our output for the past season shows a total of 7,024,613. We have filled 1,380 applications. The greater number of these called for Brook Trout; 2,280,188 Brook Trout were shipped from here this season, of which number 1,357,188 were fingerlings, the remainder being planted as fry. The total number of trout shipped were 80 per cent. of the eggs received.

Local fishermen have had unusually good success fishing in Grass Pond this season, one party catching 117 Brook Trout in one day, the fish measuring from seven to ten inches in length. There is no doubt that these fish were planted from this station two years ago as fry. In our nets this fall we notice a great many small whitefish which are the result of the stocking done in recent years, and promise a supply of eggs in the future.

We used nets in many of the local waters this fall in an effort to get Lake Trout eggs to take the place of those formerly received from the Great Lakes.

New cement walks have been laid on the hatchery grounds this summer by the regular hatchery employees. The ice house and meat room need some repairs which we expect to complete before cold weather. With this work done, the buildings and grounds will be in very satisfactory condition for the coming year.

During the fishing season last fall we had more nets fishing than in former years; but did not meet with the usual success in collecting eggs. I think this was due to the unusually warm weather and the fact that there was very little wind. I have observed that during a season when we have high winds and cold weather we get more eggs. I have also noted that when the water in the lakes and streams is high the fishing for spawn is not as successful as in low water.

One trouble in collecting Lake Trout eggs in our Adirondack

lakes is that the trout do not seem to have any particular place for spawning, but are found in various parts of the lakes near the shore. This makes it difficult to catch them, as our pound nets cannot be easily moved and the extensive use of gill nets is injurious to the fish.

The eggs received at this station during the past season were much younger than those received formerly, and a very much smaller percentage was lost when they were placed in the cold water.

Very little trouble was experienced by the loss of fish during transportation. While carrying fish in the cans on the road it is absolutely necessary to keep them well iced and the water very cold. Upon being received by the applicant they are often emptied into small streams where the water is many degrees warmer than that in which they have been carried and, as a result, a great many are lost. If a little care were taken and some of the warm water added to that in the cans and allowed to stand a short time the change would be more gradual and much better results would be obtained from the stocking of the streams.

In hatching Rainbow Trout and Black Spotted Trout at this station, I notice better results are obtained when the eggs and young fish in the hatching troughs are kept covered until the food sac is absorbed.

At the present time we have two pound nets in Little Clear, one in Big Clear, one in Hoel Pond, one in Little Green Pond, and two in Lake Placid fishing for Lake Trout and Whitefish. We also have eight fyke nets set for Brook Trout. We have taken only a few eggs as it is early yet.

The Adirondack Hatchery uses 30,480 gallons of water per hour when all the jars, troughs, ponds and outdoor races are in operation. When not using water in the hatchery for jars and troughs the flow available for outdoor races and ponds is 27,330 gallons per hour. Of this amount one pipe supplies about 360 gallons per hour, but this is not used in hot weather, as the water is too warm.

A detailed report of the egg collecting work follows:

Report of Egg Collecting Season of 1909-1910, Adirondack Hatchery
BROOK TROUT

WHEN RECEIVED OR TAKEN	Number of eggs	Where from	Condition	Kept in hatchery	Remarks
Oct. 9, to Nov. 26, 1909.....	475,000	Local waters.....	Green eggs	To date..	No. dead eggs picked off to date; 121,600 30,778
Dec. 10, 1909..	772,800	Cold Spring Harbor...	Eyed eggs	To date..	
Dec. 17, 1909..	500,000	American Fish Culture Co., Carolina, R. I.	Eyed eggs	To date..	.....48,291
Dec. 22, 1909..	200,000	American Fish Culture Co., Carolina, R. I.	.....	To date..	
Dec. 27, 1909..	100,000	American Fish Culture Co., Carolina, R. I.	Poor.....	To date..	.....340
Dec. 30, 1909..	200,000	American Fish Culture Co., Carolina, R. I.	Good....	To date..	
Dec. 30, 1909..	104,569	A. R. Graham & Son, Berkeley, Mass....	Good....	To date..	.....1,065
Jan. 6, 1910..	183,226	A. R. Graham & Son, Berkeley, Mass....	Good....	To date..	
Jan. 7, 1910..	395,704	Charles A. Woters, Weissport, Pa.....	To date..	

LAKE TROUT

Oct. 16, to Nov. 10, 1909.....	172,800	Local waters.....	Green eggs34,200
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WHITE FISH

Nov. 2, to Nov. 16, 1909.....	5,376,000	Local waters.....	Green eggs	No. dead eggs picked off to date; 121,600
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FROST FISH

Nov. 12, to Nov. 24, 1909.....	414,000	Local waters.....	Green eggs46,000
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Egg Collecting, 1910, Adirondack Hatchery

BROOK TROUT

DATE	Total eggs taken	Water where taken
1910		
October 23 to November 22.....	75,000	Little Clear and Outlet
October 13 to October 22.....	12,500	Pollywog Pond
October 16 to November 15.....	425,000	Bone Pond
Total.....	512,500	

BROWN TROUT

October 15 to November 10.....	12,000	Little Green Pond
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LAKE TROUT

October 15 to November 10.....	63,800	Little Green Pond
October 22 to November 26.....	59,800	Little Clear Pond
October 16 to November 7.....	51,600	Big Clear Pond
October 15 to October 29.....	24,800	Lake Placid
Total.....	200,000	

WHITE FISH

November 1 to November 11.....	1,554,000	Little Clear
November 3 to November 9.....	294,000	Hoel Pond
November 7 to November 13.....	2,646,000	Lake Placid
November 1 to November 12.....	1,092,000	Big Clear Pond
Total.....	5,586,000	

FROST FISH

November 13 to November 17.....	23,000	Big Clear Pond
November 18 to November 25.....	92,000	Hoel Pond
Total.....	115,000	
Total number of eggs taken, 1910.....	6,425,500	

Fish and Eggs Collected, 1910, Adirondack Hatchery
BROOK TROUT

DATE	Total fish taken	Ripe males	Ripe females	Eggs taken	Water morning	Temperature, night
October 15 to November 22.....	1,665	774	691	512,500	{ 50 38	52 40
LAKE TROUT						
October 15 to November 22.....	420	151	87	200,000	{ 50 38	52 40
BROWN TROUT						
October 28 to November 10.....	11	7	4	12,000	{ 48 42	50 44
WHITE FISH						
November 1 to November 13.....	1,474	588	386	5,586,000	40	42
FROST FISH						
November 18 to November 25.....	300	109	54	115,000	38	40
Total.....	3,870	1,629	1,222	6,425,500	.....	.....

Summary of Fish and Eggs, 1910, Adirondack Hatchery

KIND OF FISH	Total eggs taken	Total fry hatched	Total fry shipped	Fingerlings shipped
Brook trout.....	2,851,299	2,511,143	923,000	1,357,188
Lake trout.....	172,800	138,240	85,000	36,560
Rainbow trout.....	5,000	2,525	.....	1,600
Black spotted trout.....	48,000	37,000	.....	32,265
Whitefish.....	5,376,000	4,242,000	4,242,000	.....
Frost fish.....	414,000	347,000	347,000	.....

The station has no brood fish. Eggs are collected from nearby waters or bought from commercial hatcheries.

Very respectfully,

MILO F. OTIS,

Foreman.

UPPER SARANAC, N. Y., Oct. 18, 1910.

CALEDONIA HATCHERY

To the Forest, Fish and Game Commission:

The work at this station has been carried on with very good success. We have filled 878 applications, and have distributed 6,378,750 fish, of which 1,636,100 were fingerlings and 4,742,500 were fry.

An exhibit of 150 adult Brook, Brown and Rainbow Trout and 40 Albino Lake trout was made at the New York State Fair at Syracuse by this station and attracted much attention.

The eggs received here last year from Owen Sound did not turn out a very large percentage of fish. The weather being rough at Stony Island we did not get very good results from there, but hope to do better this year. We had three men at Dunkirk last year gathering Herring eggs, but the weather was bad and the fishermen lost all of their nets so we got but very few eggs. We expect to go to Erie, Pa., this year and hope to have better success getting Herring eggs there.

There has been but very little repairing done around the Hatchery this year. We built two scows, and have been cleaning part of the creek and this work should be continued until it is in good condition. The plank retaining wall at the head of the creek is much decayed and should be replaced by a concrete wall. Some of the ponds and feeders to the hatchery are in bad condition and should be rebuilt. We did some grading about the hatchery with the dirt that came out of the creek. We have partly filled an old pond near the ice house with some stone and dirt that came from the new State road improvement. The Guthrie Hatchery has been fitted with new troughs, and is in good condition now.

The station received the following eggs: From Cold Spring Harbor, 1,820,000 Brook Trout eggs, of which 500,000 were hatched out January 6, 1910; from stock fish, 1,120,000 Brown Trout eggs, all of them in good condition January 6, 1910; from Stony Island, Lake Ontario, 62,000 Lake Trout eggs; from Lake Huron, 1,102,000 Lake Trout eggs; from Fulton Chain Hatchery,

1,008,000 Whitefish eggs; from Dunkirk, Lake Erie, 4,263,000 (49 quarts) Herring eggs.

The Lake Trout egg collecting at Stony Island yielded very poor returns, and the eggs received from that locality were in very bad condition. Lake Herring work at Erie and Dunkirk was fairly successful in spite of stormy weather.

Very respectfully,

FRANK REDBAND,

Foreman.

MUMFORD, N. Y., *November 23, 1910.*

CHAUTAUQUA HATCHERY

To the Forest, Fish and Game Commission:

My transfer from Linlithgo to this hatchery on July 11th of this year makes a short time of service for my report. On taking charge I found the hatchery in good working order with the few needed repairs that come from time to time. A record of the season's work is given in another report. As the records will show, an increase of Maskalonge fry and Brook Trout fry and fingerlings was made over last season. On July 11th about 85,000 Brook Trout fingerlings remained for distribution which were disposed of on August 31st. They were as nice fish for their age and kind as I ever saw, showing that the artesian water used for propagating is of the best. With the contemplated proposition to establish a Black Bass hatchery in connection with the present work carried on, I would not recommend much change or improvement until the situation is determined. While there may be, I do not know of a more favorable location for bass propagating in the State than here.

First: There is practically no expense in getting the adult fish for spawning, as they are captured in the nets used for collecting Maskalonge eggs at a favorable time for putting them in the spawning ponds.

Second: When they are through spawning they can be returned to the lake, thereby saving any care and feeding the year around, which is quite an item, besides where the fish are returned to the lake in their natural element when through spawning, results from year to year will be much better than they would if the adult fish were kept confined and artificially fed in the ponds.

Third: It will take less pond room where the adult fish are disposed of in this way and more easily constructed ponds to raise the same number of young bass than if the adult fish were to be kept as the spawning ponds could then be used for rearing the young fish.

I have looked over the situation and believe a suitable location for the work can be had and would urge that the proposition be given early attention, that we may be able to make a start propagating next spring.

As it is well known, the propagating of the Black Bass is past the experimental stage and is carried on with varied success. In my judgment this is one of the most important of our State fishes, and ought to receive much attention, as they are a hardy fish and thrive in most of our waters.

Respectfully yours,

GRANT E. WINCHESTER,

Foreman.

BEMUS POINT, N. Y., *October 1, 1910.*

The following record of Maskalonge culture at the Chautauqua Hatchery is by R. R. Brown, who was in charge of the station until July 11, 1910, when he was relieved by Grant E. Winchester.



Banded Maskalonge, Chautauqua Lake, Weight 35 lbs. Caught by W. P. Van Wert.



Maskalonge, Saint Lawrence River.

Record of Maskalonge Work

DATE	Total fish taken	Ripe males	Ripe females	Eggs taken	Water morning	Temperature, night	Quarts of egg
April 13, 1910	15	1	1	10,500	47	.....	$\frac{1}{4}$
April 14, 1910	30	6	4	168,000	46	.....	4
April 15, 1910	40	2	1	42,000	48	48	1
April 16, 1910	30	3	1	94,500	49	51	$2\frac{1}{2}$
April 17, 1910	120	28	13	262,500	49	50	$6\frac{1}{2}$
April 18, 1910	77	17	8	210,000	48	52	5
April 19, 1910	120	7	3	136,500	50	50	$3\frac{1}{2}$
April 20, 1910	163	20	8	630,000	47	47	15
April 21, 1910	85	16	8	178,500	46	46	$4\frac{1}{2}$
April 22, 1910	90	14	5	262,500	46	50	$6\frac{1}{2}$
April 23, 1910	125	12	6	304,500	49	46	$7\frac{1}{2}$
April 24, 1910	100	13	5	189,000	48	48	$4\frac{1}{2}$
April 25, 1910	141	18	9	409,500	47	48	9
April 26, 1910	150	15	7	199,500	48	48	$4\frac{1}{2}$
April 27, 1910	200	20	9	283,500	46	48	$6\frac{1}{2}$
April 28, 1910	180	25	12	483,000	48	48	$11\frac{1}{2}$
April 29, 1910	185	26	14	567,000	48	49	$13\frac{1}{2}$
April 30, 1910	140	17	9	430,500	50	50	$10\frac{1}{2}$
May 1, 1910	250	35	18	850,500	50	52	20
May 2, 1910	175	18	10	661,500	53	54	$15\frac{1}{2}$
May 3, 1910	180	30	15	892,500	52	52	$21\frac{1}{2}$
May 4, 1910	100	8	4	283,500	51	52	$6\frac{1}{2}$
May 5, 1910	125	15	9	462,000	51	51	11
May 6, 1910	100	14	7	462,000	51	53	11
May 7, 1910	75	7	3	252,000	53	54	6
May 8, 1910	50	5	2	126,000	54	54	3
May 9, 1910	35	.....	.....	.....	54	54	.....
May 10, 1910	20	.....	.....	.....	.....	.....	.....
Totals....	3,101	387	191	8,851,500	.....	.....	210 $\frac{1}{2}$

COLD SPRING HARBOR HATCHERY

To the Forest, Fish and Game Commission:

Having passed a very successful season, I take pleasure in reporting on the different branches of work carried on at this station. Through the kindness of Mr. Slade, President of the South-side Sportsmen's Club, Oak Dale, L. I., who gave us the privilege of taking trout spawn from the club ponds, a fine lot of Brook Trout eggs was collected. The club people helped us in the work in every way possible. The 1,000,000 eggs collected from our stock trout with 1,000,000 purchased from a commercial hatchery at Weissport, Pa., gave us about all we could handle. After being eyed up, a large part of these eggs were sent to the several hatcheries. Some trouble caused a loss among our trout fingerlings in early summer. Dr. Tarleton H. Bean, our fish culturist, after examining, pronounced it one of the flagellates, which attacks the

fish and if very numerous will clog the gills and cause inflammation. By drawing down the water in the supply pond and adding several doses of salt the trouble was overcome. With the Tomcod work we had difficulty in locating the spawning fish. After trying several places where we had collected spawn, we located them at Canoe Place, on Shinnecock Bay. The fishermen were catching them in large quantities and shipping to New York markets. We collected a fine lot of eggs and hatched fry enough to fill all applications for the water on both sides of Long Island and Jamaica Bay. This work can be greatly increased by a small outlay of money, giving us proper facilities for handling double the amount of eggs. The smelt came in great numbers at the usual spawning time, but the fish were small, a great many of them one year old, showing good results from the planting of the previous year. For this reason not so many eggs were collected as the year before. The eggs hatched well and many millions of fry were planted in nearby streams and the up-State lakes. We collected a fine lot of winter flatfish eggs, hatched and planted them as usual. This work can be increased by repairing our salt water pond and doing it at the main hatchery. Our small building used for this work is so situated that the north and west winds which prevail during March and April bring our suction pipe on the lee shore where it often gets clogged with drift or gives us roiley water. The repairing of this pond is also needed for the Tomcod work. Next in importance is the Lobster work. This season broke all previous records, but the hatching is done on Fort Pond Bay, near Montauk, Long Island, with floating boxes such as were used by Mr. Seth Green in hatching shad on the Hudson river years ago, and discarded later for more improved methods, which require a building with hatching table and jars, yielding far better results. The fishermen rendered us great assistance and were pleased with the work. At the close of the lobster hatching the Sea Bass began to spawn. These eggs can be hatched in floating boxes, but owing to the rough water, the eggs being semi-buoyant, it is impossible to hold them. We have been requested to stock the harbors on the north side with Blue Crabs. In early fall they are carrying their eggs and

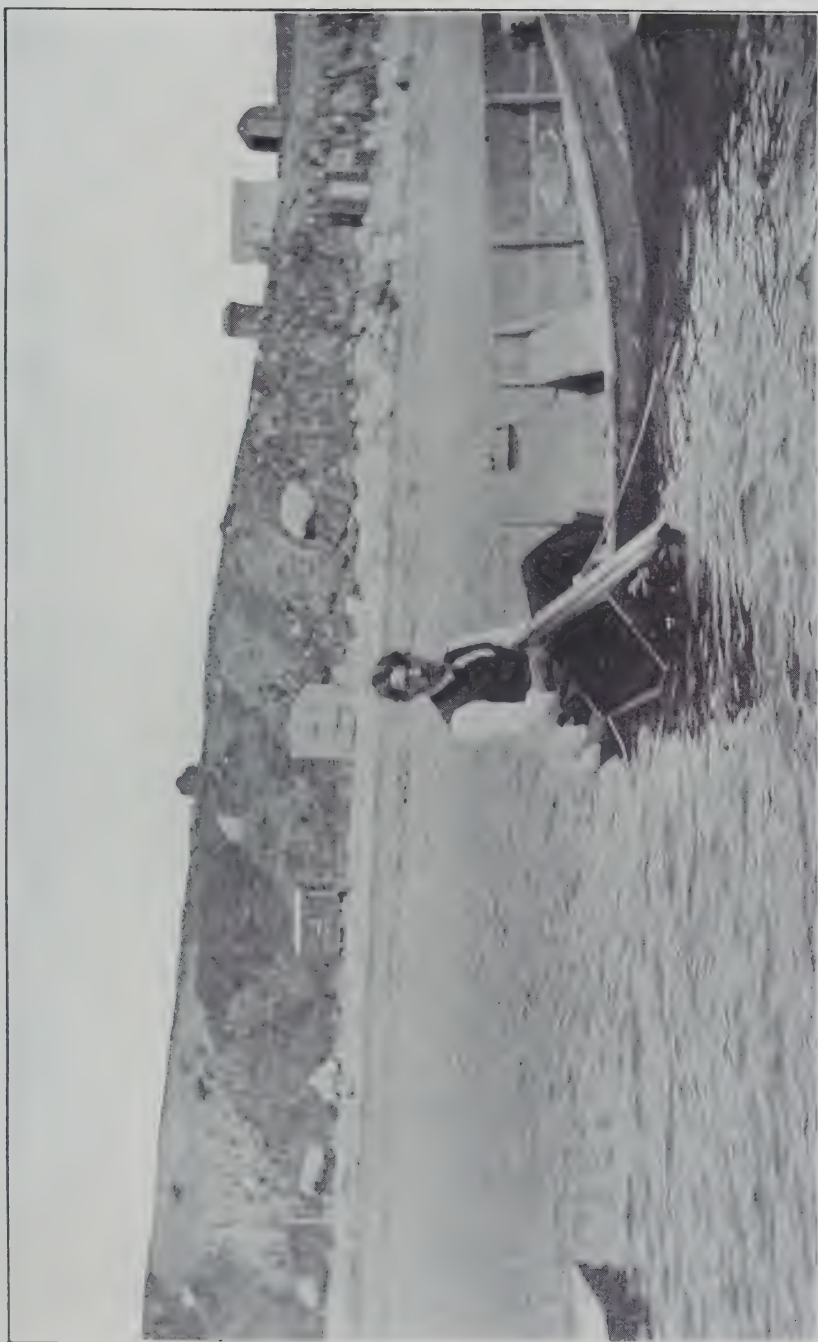


Photo B. F. Wood,

Hatching Lobsters, Montauk, N. Y., July, 1910.

can then be collected and planted where needed. We also planted a lot of adult crabs which would spawn later in the season. The total output of eggs and fish from this station numbers about three hundred and sixty millions.

Our output of marine fishes could be greatly increased. During the past season our salt water hatchery has been equipped with gas engines which take the place of the hot-air pump, that being entirely worn out. We have also placed gas engines in our pump house near the main hatchery, the steam boiler being condemned. Some improvements have been made on the grounds. Our ice house needs repairing, and we need a reservoir for our salt water or marine work. Some changes could be made in the hatching room, giving us more space for our hatching jars and increasing our work in that line.

Record of Eggs, Season of 1909, Cold Spring Harbor Hatchery
BROOK TROUT

DATE	Total eggs taken	Water where taken	Remarks
.....	1,000,000	Weissport, Pa.	2,900,000 of these were sent to other hatcheries.
.....	2,904,000	Oakdale, Long Island.....	
.....	945,000	Hatchery Ponds.....	

DELAWARE HATCHERY

To the Forest, Fish and Game Commission:

The work at this station for the past year has been up to the usual standard. Our output was increased over last year by the addition of Brown Trout. The output this year consisted of Brook and Brown Trout. The Brown Trout eggs were procured from the Caledonia station. Eight hundred and forty-five cans of fish were planted.

Disease of any kind among the fish this year was rare.

As usual the fishing in nearby waters has been good. Rainbow Trout were caught again this season in the Delaware river by fly

fishing, from last year's planting, that ran from seven to eight inches long. That I consider a very satisfactory growth for fish one year old. A few large Brook and Brown Trout were again this year taken to the Cobleskill fair for exhibit through the fair week.

As the spawning season is near at hand again I hope to procure a large number of Brook Trout eggs from our own stock fish and nearby waters.

The spruce and pine trees which were set out here on State land last year by the Forestry Department are doing well.

I suggest that an appropriation of \$150 be procured this winter, to be used for improvements during the coming spring for cement walks around races and cement outlets or sluices from ponds, and a few other things which may be needed.

Respectfully yours,

H. E. ANNIN,

Foreman.

MARGARETVILLE, N. Y., *October 31, 1910.*

The following eggs were received up to January 1, 1910, by Foreman Annin:

December 23, 1909, 200,000 Brook Trout eggs from Plymouth, Mass.

December 30, 1909, 300,000 Brook Trout eggs from Plymouth, Mass.

December 28, 1909, 100,000 Brook Trout eggs from Berkeley, Mass.

December 29, 1909, 100,000 Brook Trout eggs from Berkeley, Mass.

December 31, 1909, 150,000 Brown Trout eggs from Caledonia Station.

On January 17th, during a visit to the Delaware Hatchery, I found in the building Brook Trout eggs from stock fish, from the Plymouth Rock Trout Co., and from A. R. Graham & Son, all in good condition. There were about 3,000 fingerling Brook Trout in the hatchery troughs and about 1,900 fingerling Brook Trout in

two cement ponds outside of the hatchery. There were also about 600 trout, 2 years old and older, in the large pond near the foreman's dwelling.

I could not discover any trace of disease among the trout in the hatchery troughs. The outside ponds were covered by ice and snow to such a depth that it was impossible to report upon their condition.

The foreman's house was greatly in need of a furnace to heat it satisfactorily. The hatchery building and the outside races and ponds were in excellent condition.

If the dam is in proper condition to permit the use of a larger pipe than the one now in place to supply the hatchery and ponds, I think it would be possible to increase the volume of water and thereby extend the work in both hatchery and ponds. The present pipe is six inches in diameter.

FULTON CHAIN HATCHERY

To the Forest, Fish and Game Commission:

The work at this station has been very satisfactory this season. The total output has been increased by several millions of fry and fingerlings. These were planted as follows: Brook Trout fry, 45,000; Brook Trout fingerlings, 327,500; Lake Trout fry, 29,000; Land Locked Salmon, 23,000 fingerlings; Whitefish fry, 5,500,000; Frost fish fry, 1,000,000, making a total of 6,924,500 fish. We also shipped 1,000,000 Whitefish eggs to Caledonia Hatchery. The taking of wild Brook Trout for spawning is growing more difficult every year. The same applies to the Frost fish, which are getting scarce in the Fulton Chain and seem to grow more so every year. I think the Bass are driving them out. The lakes are polluted with sewage which is another reason for the scarcity of all species of fish in the Fulton Chain. The Lake Trout and Whitefish are holding out better than the other species as they are deep-water fish and are not affected by either the Bass or the sewage.

I recommend that we lay another pipe from the dam to the

hatchery as we do not have sufficient water for the feeding season. This could be done without much cost and would increase the capacity of the hatchery for fingerling trout.

The hatchery and boat house have been painted this summer. The ice house needs to be painted next season, and will also have to be shingled and new sills put under it before this can be done.

The retaining pond has been rebuilt with concrete and is now in good condition. We ought to have a concrete sidewalk along the street in front of the hatchery. This is one of the principal thoroughfares of the village and we have the poorest walk of any of the property owners along it.

The following is a record of the egg collecting season:

BROOK TROUT					
DATE	Kind	Total fish taken	Ripe males	Ripe females	Number of eggs taken
October 9-23.....	Brook trout.....	93	52	41	36,000
LAKE TROUT					
October 24-November 11..	Lake trout.....	44	22	22	37,000
WHITE FISH					
November 5-13.....	White fish.....	788	387	401	7,770,000
FROST FISH					
November 10-24.....	Frost fish.....	950	500	450	1,173,000

We also hatched 500,000 Brook Trout eggs that were purchased at East Freetown, Mass., and 30,000 Land Locked Salmon received from the U. S. Commission.

Respectfully yours,

WM. H. BURKE.

OLD FORGE, N. Y., Oct. 18, 1910.

LINLITHGO HATCHERY

To the Forest, Fish and Game Commission:

I came to this station April 5, 1910, to familiarize myself with the detail work preparatory to taking full charge later. I became



Photo R. E. Gooding.

Linlithgo Station, Shad Pond and Rodcliff Jansen Kill.



Photo R. E. Gooding.

Linlithgo Station. Rocliff Jansen Kill, the Pumping Supply.

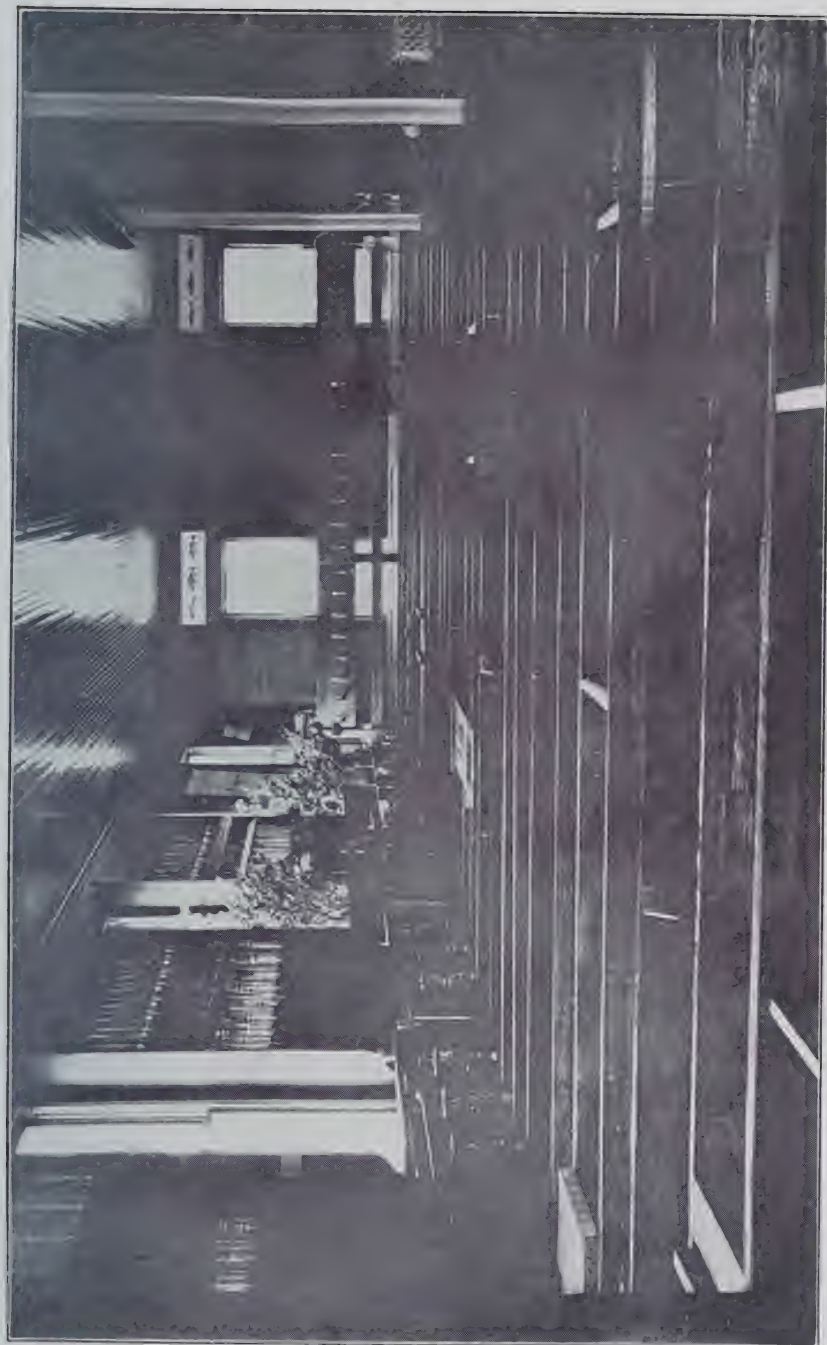


Photo R. E. Gooding.

Linlithgo Station. Hatchery Interior.

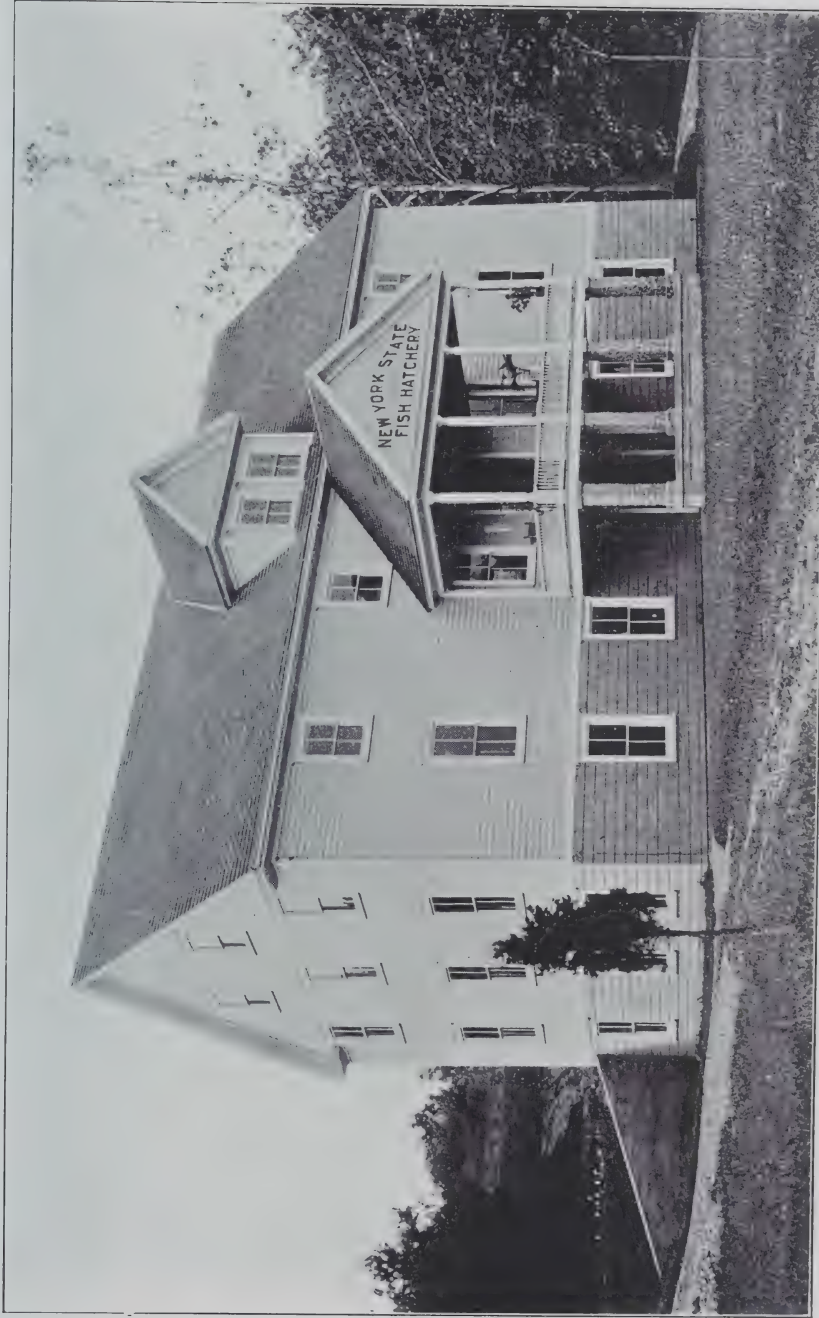


Photo R. E. Gooding.

Hatchery, Linlithgo Station, Looking North.

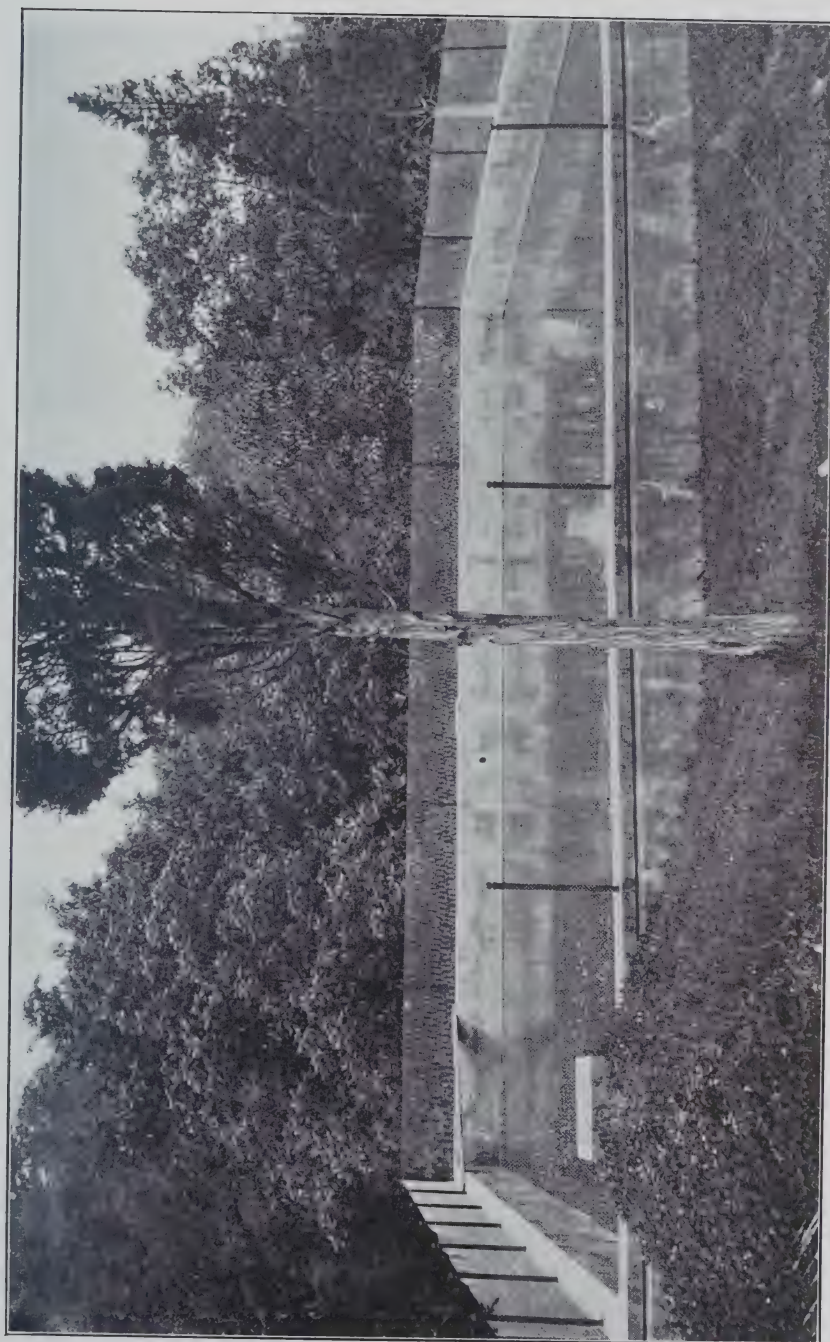


Photo R. E. Gooding.

Linlithgo Station, Reservoir 50 feet by 45 feet by 10 feet, Pumping Supply.

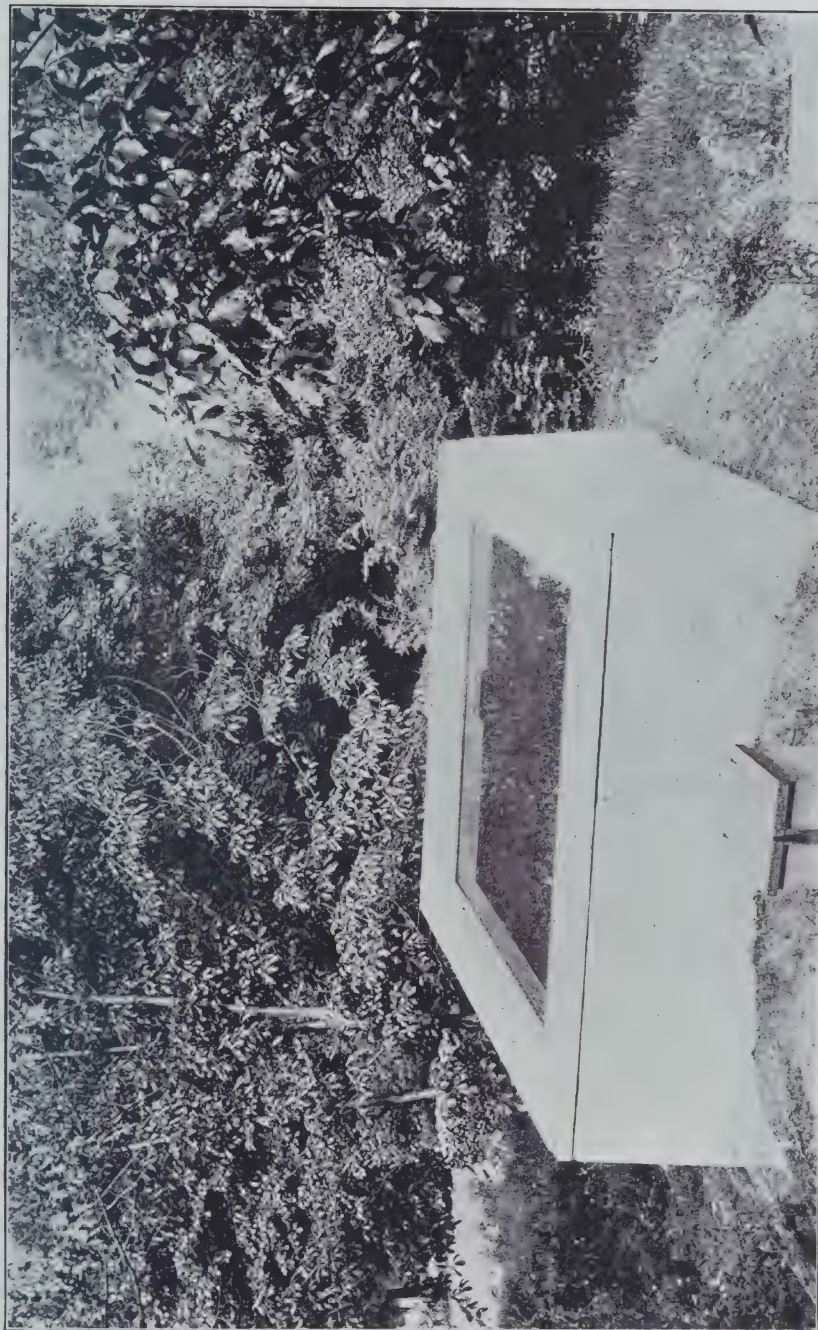


Photo R. E. Gooding.

Linlithgo Station, Distributing Tank for Kleine Kill.



Linlithgo Station, Dam and Conduit on Kleve Kill.

Photo R. E. Gooding.



Photo R. E. Gooding.

Linlithgo Station, Rapids Below Dam on Kleine Kill.

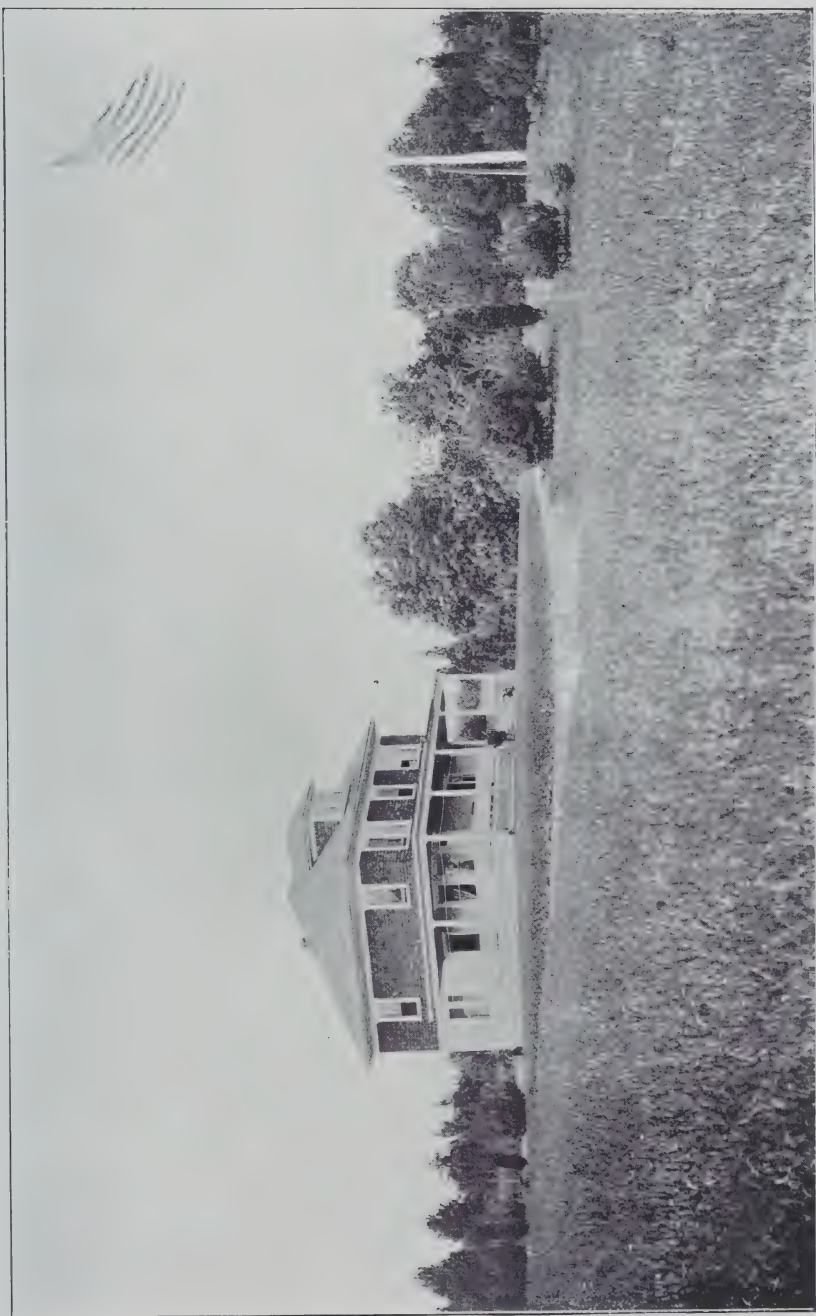


Photo R. E. Gooding.

Linlithgo Station, Foreman's Residence.

foreman on July 1, 1910, taking the place of Mr. Grant E. Winchester who was transferred to the Chautauqua Hatchery, at Bemus Point, N. Y. My report covers the work at this station from July 1, 1910.

The new road leading from the main highway to the hatchery has been widened and covered with water-washed gravel taken from the Roeliff Jansen Kill on the hatchery grounds. The road on the Bonneville tract on the north side of the Kleine Kill has also been widened and graveled. The ruins of the old mill have been taken away, the wheel-pits filled in, the embankments taken down, and the old site is leveled with the exception of one pulp pit. The woods on the V-shaped piece of land between the two streams have been trimmed, the vines and underbrush cleared out, and we now have a beautiful little grove.

Many visitors are attracted here by the beautiful scenery of the hatchery grounds. On the Kleine Kill is a terraced fall of 50 feet, and, when a liberal supply of water is coming down, we have a miniature Niagara. On the other side is the beautiful Roeliff Jansen Kill with its high banks and its crystal water bounding and tumbling along in its rocky bed. Lying between these two streams are the ponds and the hatchery in an amphitheater formed by hills of considerable elevation which are clothed with red cedar and white pine. The symmetrical red cedar, resembling church spires, gives to the landscape a scenery not surpassed. In the distance lie the historic Catskills with the "Old Indian" plainly visible.

On May 20th, 12,500 shad fry were placed in rearing ponds and on September 6th, 10,000 were liberated. They ranged from 3 to 5 inches in length. They were fed on water meal and did nicely. With additional ponds the output of fingerling shad may be largely increased. Two thousand and fifty fingerling small mouth black bass were reared and distributed this year. The larva of one of the black flies, genus *Simulium*, was found growing on the slash-boards of the penstocks in great quantities. This was found to be an ideal food for the young bass.

Snakes, turtles and birds were very injurious to the young fish. Many of these were killed, but they were a constant source of an-

noyance throughout the summer and early fall. Muskrats burrowed in the banks in the fall and gave us some trouble. Traps were set and they were captured and driven out. Constant vigilance is necessary to keep these enemies and pests in subjection.

The line fences are in a dilapidated condition and do not harmonize with the rest of the grounds. I would suggest that some suitable woven wire fence be used in the spring, to put these line fences in proper shape.

Very respectfully,

WALLACE D. RHINES,

Foreman.

LINLITHGO, *December 10, 1910.*

On May 15, 1910, Foreman Winchester reported that the black bass would soon be making their nests, and he had everything in readiness for them. The following is his account of the shad and river herring season on the Hudson river:

Report on Shad and Herring Work, Season of 1910

SHAD

DATE	Kind	Quantity		Green, number eggs	Eyed, number eggs	Remarks
May 3-28.....	Shad.....	<i>qts.</i> 378	<i>oz.</i> 24	10,605,000	5,326,000	Estimated 300 female fish used to procure these eggs.

HERRING

May 19-June 7.	Herring..	65	20	65,625,000	51,300,000	Estimated 900 fish used to procure these eggs.
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Of the shad hatched, 5,314,000 fry were planted in the Hudson river and tributaries; 12,500 shad fry were kept and put in rearing ponds to be liberated later as fingerlings; 800,000 shad fry were obtained from the New York Aquarium and planted in the Hudson river at Rhinecliff, making the total of shad fry planted, 6,114,000.

Of the herring hatched, 50,000,000 fry were planted in Hudson river and tributaries; 1,300,000 fry were kept in rearing ponds for black bass fry food.



Photo R. E. Gooding.

Linlithgo Station, Shad Pond Near Kleine Kill.

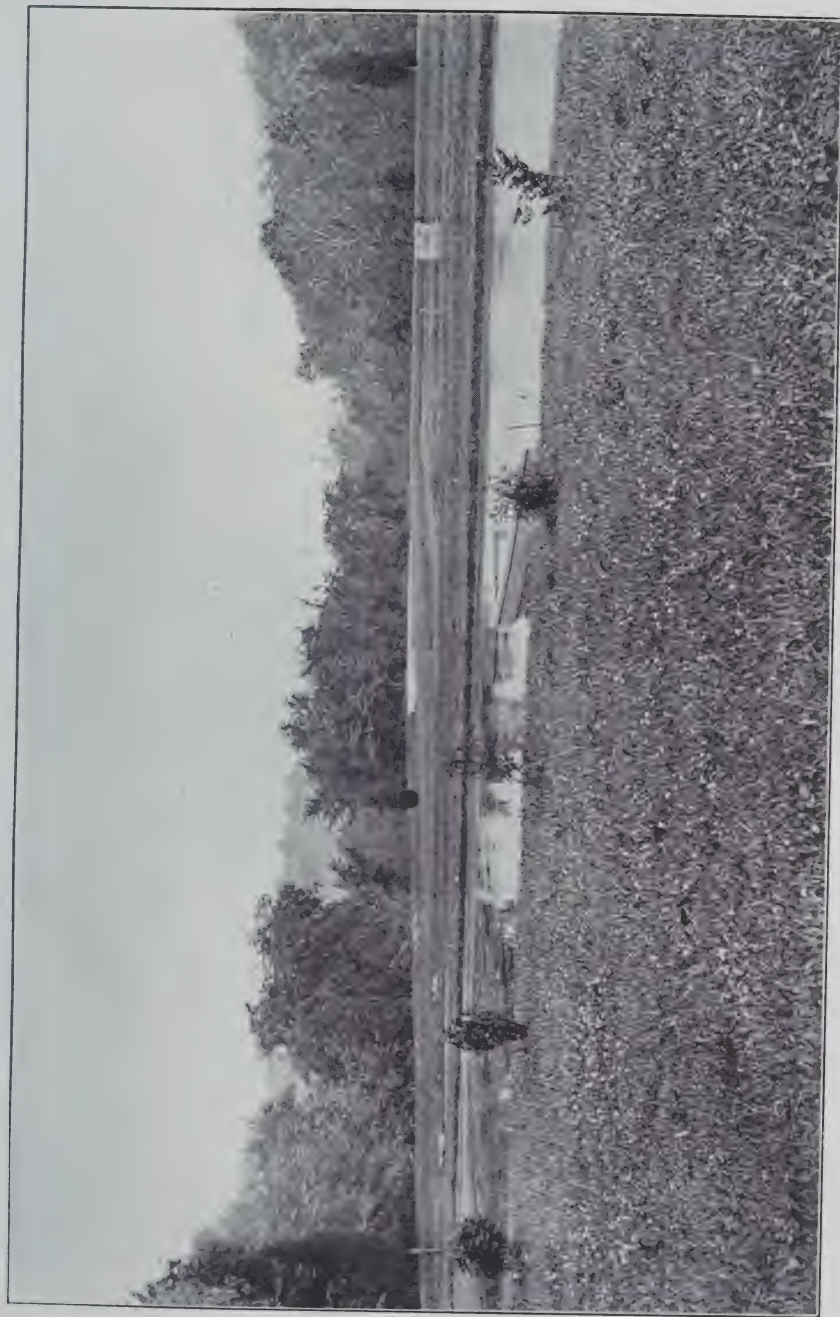


Photo R. E. Gooding.

Limithgo Station, Calico Bass Pond, 1910.



Photo by Rodney Gooding.

Upper Shad Pond, Linlithgo Station.

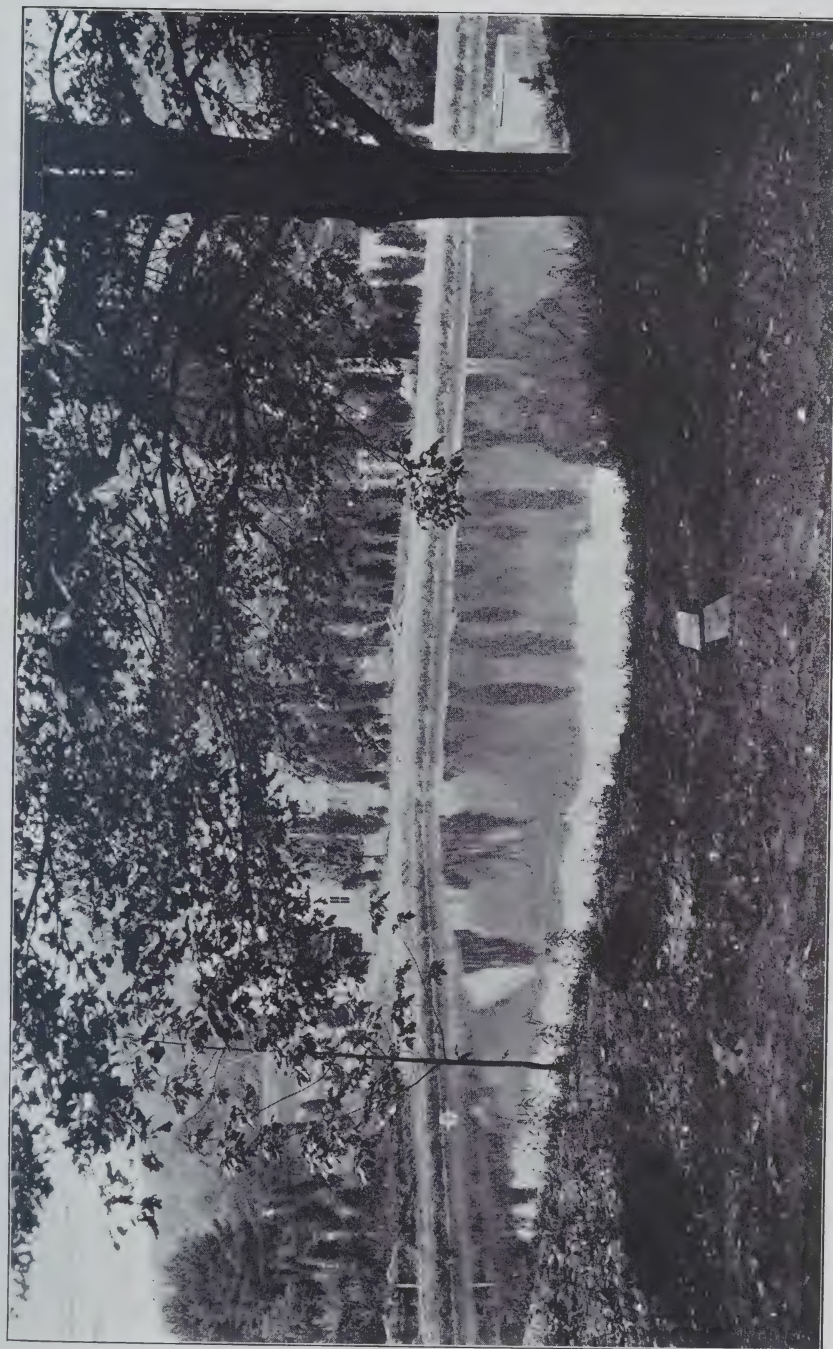


Photo R. E. Gooding.

Linlithgo Station, Pond Near Kleine Kill, 1910.



Photo R. E. Gooding.

Lindbligo Station, Terraces North of Reservoir.



Photo R. E. Gooding.

Linlithgo Station, Hatchery and Icehouse.

All of these eggs were obtained at, and near Rhinecliff and Linlithgo from the fishermen. The fishermen receiving \$10.00 per 100,000 eyed shad eggs. This being practically the first season this method has been employed for obtaining the eggs, hatchery men were furnished to instruct the fishermen how and what to do, also to receive and care for the eggs when landed on shore.

No expense was incurred for collection of herring eggs other than that hatchery men took them from the fishermen's drift nets.

Now that the fishermen have got well started with some knowledge of what to do, a better percentage of eggs should be obtained in future.

GRANT E. WINCHESTER,

Foreman.

June 23, 1910.

ONEIDA HATCHERY

To the Forest, Fish and Game Commission:

Although the total output of the Oneida Hatchery this season was not quite as great as last, it has, on the whole, been a very successful year. The total number of pike perch hatched this year was 83,733,000 fry, of which 60,608,000 were planted in Oneida Lake and 23,125,000 delivered to 107 different places in the State and planted in suitable waters.

The number of white fish hatched was 3,280,000, and the fry were planted in Canandaigua Lake. The Tullibee eggs taken from Oneida Lake hatched 6,000,000, all of which were planted in Oneida Lake.

The total number of Small Mouth Black Bass hatched was 210,650, of which 130,250 fry were planted in Oneida Lake and 73,500 delivered to 119 different places in the State; 6,900 were raised to fingerlings, of which 4,700 were planted in Oneida Lake and 2,200 in Seneca, Ballston and Saratoga Lakes. We also had 1,000 yearlings from a pond in which they were hatched last year and where they were left until June, when they were planted in Oneida Lake.

We also delivered 300,000 yellow perch fingerlings during the month of November, placing them in over 60 different localities.

We have 10,800,000 Tullibee eggs now in the hatchery that were taken in Oneida Lake. In gathering the Tullibee eggs in Oneida Lake this fall we were much hampered by not having a suitable steamboat with which to get around to the nets. The weather at the time of year when we have to get these eggs is cold and generally stormy, and as we have to go from four to ten miles from the hatchery, a good seaworthy boat is really needed.

The trees in the chestnut grove on the hatchery grounds have been trimmed and the grounds leveled up. The last of the bass ponds would have been completed this fall had not the wet weather come on so early.

The eye trouble in the small fish in Scriba creek did not appear so bad this season, but the Lamprey Eels, are very plentiful yet and kill immense numbers of fish in the lake during the summer.

On January 8, 1910, we had only Whitefish eggs in Oneida Hatchery, of which 6,695,000 were taken from wild fish in Oneida Lake on November 14, 16, 19, 24, 1909, around Eel Island, on the south side of the lake, and at Lighthouse Island, near Constantia, and 3,780,000 from Canandaigua Lake on November 27, 30, and December 4, 7, 10, 18, 1909. Total number of eggs, 10,475,000.

The Oneida Lake eggs, or Tullibees, are figured at 130,000 to the quart and the Canandaigua Lake Whitefish eggs at 42,000 to the quart.

On January 8 the eggs are all in good condition, no material loss having occurred in transportation.

The following fish were sent to the State Fair, at Syracuse, September 12-15, 1910:

Adult pike perch.....	16
Adult pickerel	18
Adult small mouth black bass.....	16
Adult silver bass.....	8
Adult rock bass.....	10



Brown Trout, Owego Creek, July 27, 1909. Result of Stocking.



Photo R. E. Gooding.

Fish Exhibit, State Fair, Syracuse, 1910.

Adult strawberry bass.....	5
Adult sunfish	25
Adult yellow perch.....	22
Adult bullheads	15
Adult lamprey eels.....	2
Adult Lawyer or Ling.....	1
Fingerling black bass, small mouth.....	15
Yearling black bass, small mouth.....	5
Yearling black bass, large mouth.....	5
Crawfish	10
Total	173

Respectfully submitted,

GEORGE F. SCRIBA,

CONSTANTIA, December 29, 1910.

Foreman.

PLEASANT VALLEY HATCHERY

To the Forest, Fish and Game Commission:

The year's work just ended at the Pleasant Valley Hatchery has shown marked improvement. We have had no trouble of any kind in handling fry or fingerling fish. All our eggs were hatched in artesian water where they mature faster than in the main spring supply. After hatching they were divided in the two supplies, but no difference has been noted in their growth. All springs and ponds have had a thorough cleaning out, and with a few repairs yet to be made we will be in good shape for the coming year's work, which we hope to make the largest in the history of this station.

THE PLANTING OF FISH

Born on the borders of the Adirondacks and having spent my boyhood days there, my knowledge of fish and animals in their wild state proved a great help when, in 1895, I decided to take up the work of fish culture. In that year I took charge of Combs Brook Hatchery for the Adirondack League Club, and for four years my work was to stock the waters of that preserve which at

that time contained 110,00 acres. Brook and Lake Trout, and Atlantic Salmon were the principal fish handled. Brook Trout for the most part were planted as fry. Our method was to go over the small spring brooks and inlets as soon as the spring freshets were gone, placing a log on a few large stones across the brook, to form a pool about one foot deep. Several of these were placed on one brook. The fry were then placed in these pools, only a few hundred in a place, care being taken not to overstock the stream. The results were that after seven years' work the club closed their hatchery saying there were plenty of fish. Now, it has been my experience that it is not the size of fish that are planted, but the manner in which they are distributed that gives the best results. Most people seem to think that all that is necessary is to dump the fish in the lake or stream regardless of temperature or other conditions. I will add here my experience in stocking a small lake in the Adirondacks several years ago with Lake Trout. This lake was situated about two miles from the hatchery and the fish had to be carried in pack cans. The water temperature at the hatchery was 60° Fahr. and once in the route the water was cooled where a spring came from the mountain. On arrival at the lake the water was mixed, to bring the temperature near that in the lake before liberating the fish. The men reported that the fish would not leave the surface, but would dart around as if crazy, and in a short time be dead. I visited the lake and found this as stated. The temperature at the surface I found to be 78°. We then took the fish to where a small inlet came in and placed them in a pool a few rods from the lake. There they showed no signs of distress. After remaining there for an hour or two, they would go out to the lake and to deep water at once. This is only one of like instances that have come under my observation. The majority of persons planting Lake Trout will take twelve or fourteen cans in a launch or row-boat, go out into the lake and dump a whole can, or perhaps two or three cans in one place. This is a great mistake as the fish will most always collect together in a school for some time, and I have seen nearly a whole can devoured by large fish before getting frightened away. The plan which I have tried and which has

given the best results in most lakes is as follows: Take a wash tub, empty the fish into it, using a dipper with a perforated bottom, dipping up only a few fish at a time and putting them out as the boat is moving along. In this way you will cover a good deal of ground and the fish will be well distributed. Too much care cannot be taken in getting fish well distributed whether in lake, river or brook.

Some people will tell you that there would be more fish in the lakes if there were no hatcheries in operation. Ask some of the old fishermen how many of the old, native fish they catch during the year. The answer will be: "One," or "not any." If the fishing in your lake or stream is not what you think it should be do not blame the hatcheries. Examine the water, find out as much as possible about the natural food, the volume of water in very dry seasons, temperature, etc., and report to the Commission which will be glad to get such information and help matters wherever it is possible to do so.

Eggs Collected, Season of 1909, Pleasant Valley Station

DATE	Total eggs taken	Water where taken	Remarks
1909. Oct. and Dec.....	329,400	Stock fish.....	Brown trout. Are not very good. Have picked off 50,000. Are hatching some and the fry are looking good.
Oct. and Dec.....	41,600	Stock fish.....	Brook trout. Fairly good. Loss to date, 10,000. Are hatching quite fast at this date.
Dec. 14.....	308,000	Cold Spring Harbor..	Brook trout. Received in good condition, with the exception of being quite dry on trays, and a good many dying in the eggs. Have picked off 30,000. Are nearly all hatched and fry looking good.
Dec. 1 to 7.....	56,600	Lake Keuka.....	Lake trout. Eggs are fairly good. Have taken off 5,000 ringers. None are hatching as yet.

Rainbow Trout spawning now.

Eggs at Pleasant Valley Hatchery, Jan. 8. 1910

Date	Kind of eggs	Number	Condition	Where taken	Loss	Present condition
1909. Nov. 29	Brook Trout.	41,600	Fair.....	Stock fish.....	10,000	Good.
Dec. 14	Brook Trout.	308,000	Fair.....	Cold Spring Harbor..	30,000	Good.
Dec. 17	Brown Trout	329,400	Not very good...	Stock fish.....	50,000	Fair.
Dec. 7	Lake Trout..	56,600	Good.....	Lake Keuka.....	5,000	Good.

Rainbow Trout just commenced spawning.

Lake Trout Work, Season of 1910

Date	Total fish taken	Ripe males	Ripe females	Eggs taken	Water, morning	Temperature night	Remarks
Nov. 16.....	3	2	1	.....	46	.....	Hard.
18.....	4	.....	.....	.....	.....	.....	Hard.
21.....	2	2	.....	.....	.....	.....	Hard.
22.....	7	5	2	.....	.....	.....	Hard.
23.....	3	.....	.....	.....	.....	.....	Hard.
24.....	20	15	5	.....	.....	.....	Hard.
25.....	7	5	2	.....	.....	.....	Hard, females, 13.
26.....	10	.....	.....	.....	.....	.....	Hard, females, 6.
27.....	18	5	.....	.....	.....	.....	Hard.
28.....	18	9	3	.....	.....	.....	Hard.
29.....	6	5	1	.....	.....	.....	Hard.
30.....	17	10	7	.....	.....	.....	Hard.
Dec. 1.....	6	3	3	.....	.....	.....	Hard.
2.....	14	7	7	.....	.....	.....	Hard.
3.....	7	4	3	.....	.....	.....	Hard.
4.....	6	4	2	.....	.....	.....	Hard.
5.....	20	18	2	.....	.....	.....	Hard.
6.....	3	2	1	.....	.....	.....	Hard.
7.....	3	.....	3	.....	.....	.....	Hard.
Totals.....	174	96	42	72,400	.....	.....	Hard.

Respectfully submitted,

HENRY DAVIDSON,

Foreman.

BATH, N. Y., Oct. 15, 1910.

FISH DISTRIBUTED BY STATE HATCHERIES

Land Locked Salmon	Pike Perch
Brook Trout	Blue Pike
Brown Trout	Yellow Perch
Black Spotted Trout	White Perch
Rainbow Trout	Black Bass (sm. mouth)
Lake Trout	Calico Bass
Shad	Rock Bass
River Herring	Sea Bass
Whitefish	Cod
Frostfish	Tom Cod
Lake Herring	Flatfish
Tullibee	Lobster
Smelt	Blue Crab
Maskalonge	

Fish Distributed in 1907, 1908, 1909 and 1910

	1907	1908	1909	1910
Adirondack.....	5,766,300	7,014,088	7,874,533	7,024,613
Caledonia.....	9,402,100	5,366,382	17,600,121	6,378,750
Chautauqua.....	5,000,000	3,846,000	8,669,500	6,666,100
Cold Spring Harbor.....	177,187,250	304,038,000	351,815,130	357,272,800
Delaware.....	249,500	715,000	605,250	827,000
Fulton Chain.....	3,477,700	3,036,336	2,218,550	6,924,575
Linlithgo.....	8366,100	881,000	10,867,000	57,947,050
Oneida.....	47,558,300	67,646,150	129,716,037	93,524,987
Pleasant Valley.....	1,449,350	1,977,150	821,100	730,100
	250,656,600	394,520,106	530,277,221	537,295,975

FISH DISTRIBUTION BY SPECIES

Summary for the year ending December 31, 1910

Brook trout, fry.....	3,131,500
Brook trout, fingerlings.....	2,726,438
Brown trout, fry.....	745,000
Brown trout, fingerlings.....	500,000
Brown trout, adult.....	75
Lake trout, fry.....	379,000
Lake trout, fingerlings.....	770,060
Rainbow trout, fry.....	321,000
Rainbow trout, fingerlings.....	431,600
Rainbow trout, adults.....	75
Steelhead trout, fingerlings.....	4,000
Black spotted trout, fingerlings.....	33,065
Atlantic salmon, fingerlings.....	4,000
Land locked salmon, fingerlings.....	23,000
Black bass, fry.....	205,800
Black bass, fingerlings.....	6,900
Black bass, yearlings.....	1,000
Black bass, adults.....	112
Total game fish.....	9,282,625



Bullheads, adult	300
Quinnat salmon, fingerlings	3,000
Silver salmon, fingerlings.....	500
Frostfish, fry	1,347,000
Lake herring, fry.....	2,250,000
Tullibee, fry	6,000,000
Whitefish, fry	15,657,000
Smelt, fry	118,000,000
Maskalonge, fry	6,196,050
Pike perch, fry.....	83,733,000
Yellow perch, fry.....	20,000
Yellow perch, fingerlings.....	300,000
White perch, fry.....	675,000
Shad, fry	6,114,000
Shad, fingerlings	10,000
River herring, fry.....	51,300,000
Tomcod, fry	57,200,000
Winter flatfish, fry.....	113,000,000
Lobster, fry	10,200,000
Blue crab, fry.....	56,000,000
Blue crab, adults.....	7,500
<hr/>	
Total food species	528,013,350
<hr/>	
Grand total	537,295,975
<hr/>	

FISH DISTRIBUTION IN 1910 BY STATIONS

Adirondack

Brook trout, fry.....	923,000	
Brook trout, fingerlings.....	1,357,188	
<hr/>		2,280,188
Lake trout, fry.....	85,000	
Lake trout, fingerlings.....	36,560	
<hr/>		121,560

Rainbow trout, fingerlings.....	1,600
Black spotted trout, fingerlings.....	32,265
Frostfish, fry	347,000
Whitefish, fry	4,242,000
	<hr/>
	7,024,613
	<hr/> <hr/>

Caledonia

Brook trout, fry.....	732,500	
Brook trout, fingerlings.....	313,100	
	<hr/>	1,045,600
Brown trout, fry.....	505,000	
Brown trout, fingerlings	364,500	
Brown trout, adult	75	
	<hr/>	869,575
Lake trout, fry.....	240,000	
Lake trout, fingerlings.....	702,000	
	<hr/>	942,000
Rainbow trout, fry.....	280,000	
Rainbow trout, fingerlings.....	256,500	
Rainbow trout, adult	75	
	<hr/>	536,575
Whitefish fry	735,000	
Lake Herring, fry.....	2,250,000	
	<hr/>	6,378,750
	<hr/> <hr/>	

Chautauqua

Brook trout, fry.....	250,000	
Brook trout, fingerlings.....	220,050	
	<hr/>	470,050
Maskalonge, fry	6,196,050	
	<hr/>	6,666,100
	<hr/> <hr/>	

Cold Spring Harbor

Brook trout, fry.....	230,000	
Brook trout, fingerlings.....	36,500	
		<hr/>
		266,500
Rainbow trout, fingerlings.....		11,500
Steelhead trout, fingerlings		4,000
Black spotted trout, fingerlings.....		800
Atlantic salmon, fingerlings.....		4,000
Quinnat salmon, fingerlings.....		3,000
Silver salmon, fingerlings.....		500
Whitefish, fry		1,900,000
Smelt, fry		118,000,000
White perch, fry.....		675,000
Tomcod, fry		57,200,000
Winter flatfish, fry.....		113,000,000
Lobster, fry		10,200,000
Blue crab, fry.....		56,000,000
Blue crab, adults.....		7,500
		<hr/>
		357,272,800
		<hr/>

Delaware

Brook trout, fry	366,000	
Brook trout, fingerlings.....	317,000	
		<hr/>
		683,000
Brown trout, fry.....	90,000	
Brown trout, fingerlings.....	54,000	
		<hr/>
		144,000
		<hr/>
		827,000
		<hr/>

Fulton Chain

Brook trout, fry.....	45,000	
Brook trout, fingerlings.....	327,500	
		<hr/>
		372,500

Lake trout, fry.....	29,000
Landlocked salmon, fingerlings.....	23,000
Frostfish, fry	1,000,000
Whitefish, fry	5,500,000
Black bass, s. m., adults.....	75

 6,924,575

Linlithgo

Brook trout, fry.....	500,000
Rainbow trout, fry.....	1,000
Shad, fry	6,114,000
Shad, fingerlings	10,000
	<hr/> 6,124,000
River herring, fry.....	51,300,000
Black bass, fingerlings.....	2,050
Yellow perch, fry.....	20,000

 57,947,050

Oneida

Bullheads, adult	300
Whitefish, fry	3,280,000
Tullibee, fry	6,000,000
Pike perch, fry.....	83,733,000
Yellow perch, fingerlings.....	300,000
Black bass, s. m., fry.....	203,750
Black bass, s. m., fingerlings.....	6,900
Black bass, s. m., yearlings.....	1,000
Black bass, s. m., adults.....	37

 211,687

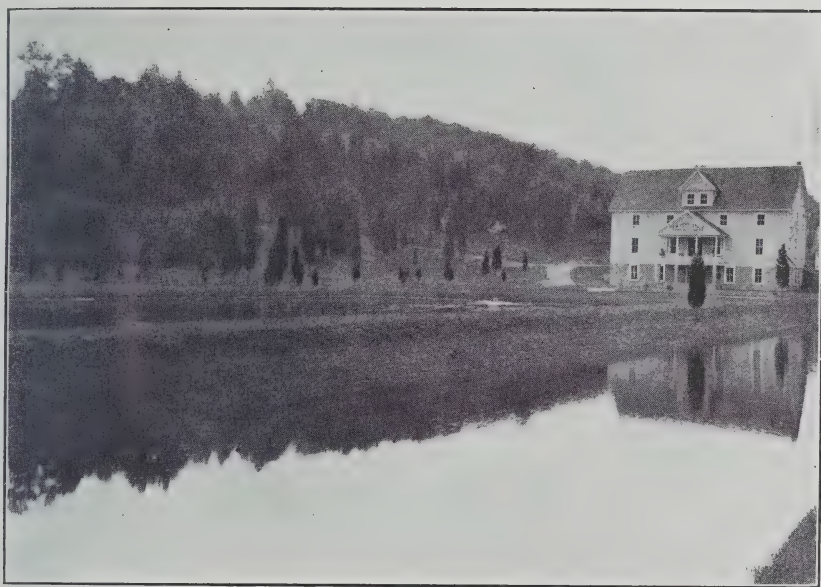
 93,524,987

Pleasant Valley

Brook trout, fry.....	85,000	
Brook trout, fingerlings.....	155,100	
	<hr/>	240,100
Brown trout, fry.....	150,000	
Brown trout, fingerlings.....	81,500	
	<hr/>	231,500
Lake trout, fry.....	25,000	
Lake trout, fingerlings.....	31,500	
	<hr/>	56,500
Rainbow trout, fry.....	40,000	
Rainbow trout, fingerlings.....	162,000	
	<hr/>	202,000
		<hr/>
		730,100
		<hr/>

FISH APPLICATIONS FILLED, 1908-1910

Hatcheries	1908	1909	1910
Adirondack	818	1,370	1,380
Caledonia	583	929	878
Chautauqua	99	104	226
Cold Spring Harbor.....	368	395	97
Delaware	363	408	462
Fulton Chain	154	78	313
Linlithgo . . . . .	.....	26	80
Oneida	209	438	383
Pleasant Valley	284	309	316
	<hr/>	<hr/>	<hr/>
	2,878	4,057	4,135
	<hr/>	<hr/>	<hr/>



Linlithgo Hatchery and Shad Pond.

BUREAU OF MARINE FISHERIES

CLINTON S. DIXON, Acting Superintendent

REPORT OF THE SUPERINTENDENT OF MARINE FISHERIES

Hon. H. LEROY AUSTIN, *Forest, Fish and Game Commissioner*:

Sir.—Pursuant to the requirements of section 188, chapter 19, of the Consolidated Laws, I have the honor to present herewith a report covering the business of the Bureau of Marine Fisheries for the fiscal year lately closed.

This report covers the second full year of operation under the Marine Fisheries Law of 1908 (re-enacted as Article XII of chapter 24 of the Laws of 1909).

BUSINESS OF THE YEAR

Surveys.—As was shown in the 1909 report of your Superintendent, the principal operations during that year were on the north coast line of Long Island between Port Jefferson and Horton's Point, sixty signals having been located within these limits, including some United States coast and geodetic points. The stretch of shore covered about thirty-six miles. The completion of this work opened up a large area of lands under water for future shellfish cultivation. All of the triangulation work which had been marked out for the year was fully completed before the close of the season, thus affording an opportunity to make substantial progress on preliminary work upon the extension of the system from Horton's Point easterly to Orient Point, which is about twelve miles from Horton's Point, and is the most easterly point upon the northerly side of Long Island.

Following along the line as planned last year for a continuation of triangulation survey, the work has been and is now being done, as given in the report of the engineer of this bureau.

During the last fiscal year the records show 41 new leases issued, covering 1,082.8 acres, located as follows:

17	Jamaica Bay	64.4 acres
9	Long Island Sound.....	448.0 "
10	Raritan Bay	316.2 "
2	East Chester Bay.....	13.0 "
3	Hudson River	241.2 "
<hr/>		
41		1,082.8 "
<hr/>		

There were also issued 180 renewals, covering 977.1 acres, located as follows:

179	Jamaica Bay	970.3 acres
1	Raritan Bay	6.8 "
<hr/>		
180		977.1
<hr/>		

There were also leased during the fiscal year, but not executed until after September 30, 1910, 23 new leases, covering 240.8 acres, located as follows:

1	Raritan Bay	45.8 acres
4	Long Island Sound.....	44.4 "
18	Hempstead Harbor	150.6 "
<hr/>		
23		240.8 "
<hr/>		

There were also renewals of leases not executed until after the close of the fiscal year, as follows:

4	Raritan Bay	19.8 acres
<hr/>		

REPORT OF CHARLES WYETH, ENGINEER

Mr. Clinton S. Dixon, Acting Superintendent Marine Fisheries:

Sir.—I have the honor to present the following report of my work surveying and mapping lands under water of the State of

New York for shellfish culture and preparing the necessary papers connected therewith, for the fiscal year ending October 1, 1910.

My principal work during the past year has been the triangulation of the coast line between Horton's Point and Orient Point, Long Island Sound, and the triangulation of Hempstead Harbor, and the survey of oyster lots in Long Island Sound, Raritan Bay and Hempstead Harbor.

In the triangulation survey between Horton's Point and Orient Point and Plum Island, about thirteen miles in length, I established and located thirty-six signals, three of which are tripods and the remaining thirty-two natural objects, thus saving the expense of erecting tripods.

This survey is in continuation of the coast survey between Port Jefferson and Horton's Point. The thirty-five signals located and described are Bushy Tree, Horton's Point Light, Box, House, Thomas' Barn, Sutton's Chimney, Woodworth's Chimney, White Cupola, Greenport, Standpipe, Pilot Tree, Rock 17-B, Rock 18, Jerome Hill, Summer House, Rocky Point Life Saving Station, Rock 19, Rock 19-A, Birdseye, Brown's Hill, Long Beach Range, Moses Rock, Colonial House, Farm Chimney, St. Thomas, Rock 20, Orient Ch. Steeple, Rock 21, Plum Gut Light, Rock 22, Beebe, Plum Island Light, North Gable, Orient Hotel, White House, Orient School. These signals are located along the coast line between Horton's Point and Plum Island, where we have a system of thousand-acre townships divided into one hundred ten-acre lots, thus being able to accommodate the applicant for large or small acreage.

The State having received many applications for leases of oyster lands under the waters of Hempstead Harbor it became necessary to make a triangulation survey of the entire bay with a coast line of about twelve miles and to designate and locate signals along the shores for the purpose of surveying the lands applied for. This work I also accomplished the past season, establishing and locating thirty-two signals around the harbor, as follows:

Matinecock 3, Execution Light, Sea Cliff Wharf, Harkness, Maxwell's Breakwater, Delma, New York Yacht Club Flag-Staff,

Garvey, Rec, Standpipe, Gould's Derrick, Mott 2, Mott's Dock, Water Tank, Gug, Glen Cove Light, Yacht House, Truss, Pump Chimney, Canning, Karat, Karat Cupola, Electric Light, Scudder, Dock, School, Stern's, Hogan, Ward, Emery, Stern's Cupola, Red. Of these thirty-two signal stations but one tripod, that over Mott 2, was built, and seven flags over others; the remaining twenty-five being natural objects.

During the year I have made fifty-seven other surveys of individual tracts, located as follows:

Locality	New Surveys	Acres
Hempstead Harbor	18	150.6
Long Island Sound	12	414.8
Raritan Bay	9	316.4
	<hr/>	<hr/>
	39	881.8
	<hr/>	<hr/>

Locality	Resurveys	Acres
Jamaica Bay	4	21.0
Raritan Bay	8	84.4
	<hr/>	<hr/>
	12	105.4
	<hr/>	<hr/>

Six tracts in Long Island Sound in the vicinity of Mattituck were surveyed in relation to our recent triangulation in townships and ten-acre lots. These tracts had been laid out before from the shore before the triangulation system had been completed in that locality.

Long Island Sound, 6 surveys, 2,285.0 acres.

Each year it becomes necessary to repair some of the signals and at intervals to entirely rebuild others, and on new survey work it is generally necessary to have some tripod signals, although as many natural objects are taken as can be used to advantage.

During the year the tripod signals on the southerly shore of Staten Island, used in the Raritan Bay surveys, were repaired and painted. Also repairs were made on some of the signals between Port Jefferson and Horton's Point, and all were inspected. There

are some signals that should be rebuilt which have been destroyed by time or storm and which we will need in the near future. These lie between Lloyd's Point and Stony Brook, as follows: St. John-land's Flag Pole and East Bluff, and there are others that will require attention between the points named.

I am now at work on the triangulation system between Horton's Point and Orient Point, covering about thirteen miles, making projections and platting up the signals and transferring signals to the working maps from the data obtained on the surveys of the past season.

We have received applications for oyster leases in Manhasset Bay, and it will be necessary to make a triangulation survey of that bay before individual surveys can be made.

In the Manhasset Bay triangulation survey it will be necessary to have a power boat.

I would therefore respectfully suggest and urge that provision be made to carry on this important work, which should be done as soon as possible. An approximate estimate for power boat hire, repairing and building of signals for 1911 would be about one thousand dollars.

Respectfully submitted,

CHARLES WYETH,

Engineer, Bureau of Marine Fisheries.

NEW YORK, October 1, 1910.

Assignments.—During the year fifty-nine (59) tracts covering nine hundred sixty-six and five tenths (966.5) acres have been assigned to the State under the authorization contained in the Marine Fisheries Law. They are as follows:

12	tracts under lease in Jamaica Bay.....	112.6	acres
3	“ “ “ “ Raritan Bay	7.6	“
2	“ “ “ “ East Chester Bay	31.6	“
3	“ “ “ “ Long Island Sound ...	600.0	“
37	“ “ franchise, Raritan Bay	182.8	“

I	"	"	"	Long Island Sound...	26.9	"
I	"	"	"	Little Neck Bay	5.0	"
					<hr/>	
					966.5	"
					<hr/>	

Many assignments between individual holders have been made.

Assignments are made subject to the approval of the Commissioner, and when made must be recorded in the office of the Superintendent of Marine Fisheries.

One hundred and ninety-five (195) such assignments have been recorded in the office during the year.

Revenues.—A large increase in the receipts of this bureau over those of last year will be noted by the following:

	1909	1910
October,	\$1,263 42	\$2,347 22
November	249 08	1,990 42
December	359 95	249 12
January	972 00	386 62
February	3,260 18	5,162 91
March	3,511 61	7,635 37
April	1,836 67	1,140 55
May	559 66	1,055 38
June	1,174 82	1,522 74
July	2,097 06	931 27
August	289 29	686 45
September	1,926 63	1,637 90
<hr/>		<hr/>
	\$17,500 37	\$24,745 95
Advance deposits on ren-		
tals	1,070 90	870 80
<hr/>		<hr/>
	\$18,571 27	\$25,616 75
<hr/>		<hr/>

CLASSIFICATION OF REVENUES.

	1909	1910	
(a) From rentals of shellfish lands.....	\$8,167 62	\$14,582 00	
From forfeited deposits upon rentals...	12 00	85 00	
From advance deposits on rentals.....	1,070 90	870 80	
		\$9,250 52	\$15,537 80
(b) From taxation of shellfish lands.....	\$6,911 99	\$7,399 82	
From penalties under Tax Laws.....	294 28	164 44	
From interest on deferred tax payments.	23 83	11 65	
		\$7,230 10	7,575 91
(c) From recording fees.....	\$480 25	\$467 00	
From license fees.....	1,550 00	1,850 00	
From relocation surveys.....	30 40	148 73	
From recoveries.....	30 00	20 00	
From sheriff's fees.....		17 31	
		2,090 65	2,503 04
	<u>\$18,571 27</u>		<u>\$25,616 75</u>

(d) The revenue as compared with former years.

Before the Marine Fisheries Law took effect the revenue for the five years from 1901 to 1905 inclusive was as follows:

1901	\$1,812 40
1902	1,589 84
1903	1,574 94
1904	1,523 22
1905	2,496 79

Total for five years \$8,997 19

Rules for Leasing Shellfish Lands.—The rules governing the leasing of shellfish lands have been amended during the year (in effect October 1, 1910) as follows:

1. Auction sales of leases of lands for use in shellfish cultivation shall be held at the office of the Bureau of Marine Fisheries, No. 1 Madison Avenue, Borough of Manhattan, City of New York.

2. The second Tuesday in each month is designated as a sales day for leases. The meeting is called at ten o'clock A. M. on that day.

3. A calendar will be made up, upon which will be noted, consecutively numbered, applications filed subsequently to the sales day in the preceding month, and also such applications as may have been carried over from preceding sales by adjournment.

4. In case the applicant fails to answer upon the first call, his application will be placed at the foot of the calendar, to be taken up after the applications which are marked ready are disposed of.

5. Should an applicant fail to respond upon the final call (in the absence of a proper reason for adjournment), the lease will nevertheless be exposed to bids at public auction, and in case there are no bids, the application will be deemed to be abandoned and will be marked off the calendar.

6. No bid for a less sum than two dollars per annum per acre will be received, and the right to reject any or all bids is reserved.

7. At the time of filing an application for lands under water for shellfish cultivation, the applicant shall deposit a sum of money equal to twenty-five per centum of the amount of one year's rental for the number of acres for which application is made, calculated at the minimum price at which said lands are authorized to be leased; such deposit to be credited upon the rental. Should the application be withdrawn or abandoned by the applicant, this deposit shall be forfeited to the State. In case the lease should be awarded to a bidder other than the applicant, the deposit will be returned to the applicant and a like deposit required from the successful bidder.

8. Upon the first day of October following an award of land at public auction, one year's rent in advance shall become due and payable, to which amount shall be added the pro rata amount of rent due from the day of the award to the said first day of October, with credit for the advance sum deposited under Rule 7. In case a survey of the land shall not have been completed upon the said first day of October, then the number of acres named by the applicant in his application shall be taken as the acreage of the tract, for the purpose of the bill, subject to correction and adjustment upon the completion of the survey.

9. The term of every lease of lands for shellfish cultivation shall begin at and from the day of the award of the same at public auction, and rent is payable from that day in manner as provided by these rules. The time of payment of such rents shall, so far as possible, be adjusted so as to make the rental year coincide with the fiscal

year, as established in this State, to-wit, beginning on the first day of October.

10. Rentals are due and payable in advance, except as provided in Rule 8, and if not paid within thirty days of the time when due, interest at the rate of six per cent per annum, to be calculated from the time such rent became due to the day of payment of same, shall be added.

11. Holders of shellfish grants or leases shall not assign any such grants or leases while indebted to the Bureau of Marine Fisheries for rentals or otherwise.

12. If there should arise a question of there being a natural growth of oysters upon the land included in any application, the sale of the lease may be made subject to the settlement of such question, and in case it is determined that the land contains a bed of oysters of natural growth, the deposit shall be returned to the party in interest, and the application be discontinued.

13. Applications for lands in Long Island Sound must be adapted to the basic survey, as shown upon maps filed in this office. Under this survey the lands are laid out in townships and lots, the lots containing ten acres and the townships 1,000 acres.

During the year fifty-three (53) new or original applications for leases of grounds for the cultivation of shellfish were received, covering one thousand one hundred eighty-four and eight-tenths (1184.8) acres. Seven (7) of these applications, covering sixty-four (64) acres, were withdrawn, and three (3), covering twenty-three (23) acres, were dismissed.

License Fees.—Under “Classification of revenues” (c) the item of license fees covers licenses issued as follows:

68 Lobster	\$1,270 00
31 Food Fish	155 00
17 Menhaden	425 00
	<hr/>
	\$1,850 00
	<hr/>

There was an increase in the number of licenses issued, over the previous year, of ten (10) for lobsters, twenty-one (21) for food fish, and one (1) for menhaden.

In previous reports of the Superintendent of this bureau attention has been called to the Commission of the urgent need for a boat or boats to be used in carrying on the triangulations and basic hydrographic surveys and the necessary measurements for the allotments of oyster lands; to determine the character of the bay and sound bottoms upon which may be based an accurate knowledge of the value of the different localities for shellfish culture; for the prevention of illegal and improper taking of lobsters, oysters, clams, escallops, etc., and to prevent the placing of nets in prohibited localities. The need of a boat becomes more apparent each year; and it is recommended by your Superintendent that a suitable appropriation be made for the purchase and maintenance of a proper boat.

Salt Water Fish.—The following list of the food fishes, principally marine species, which were sent from Cold Spring Harbor during 1910, is furnished by the State Fish Culturist:

Smelt	118,000,000
White Perch	675,000
Tomcod	57,200,000
Flatfish	113,000,000
Lobster	10,200,000
Blue Crab	56,007,500
<hr/>	
Total	355,082,500
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Of the Blue Crabs, 7,500 were adults with eggs almost ready to hatch. The White Perch were obtained from eggs collected at Havre-de-Grasse, Md., and presented by the Bureau of Fisheries, Washington, D. C.

Respectfully submitted,

CLINTON S. DIXON,

Deputy Superintendent of Marine Fisheries.

NEW YORK, December 31, 1910.

DEPARTMENT OF GAME PROTECTION

JOHN B. BURNHAM, Chief Protector



Sixteen Fykes and One Trap Net Seized at Cross Lake.

REPORT OF CHIEF GAME PROTECTOR

Hon. H. LEROY AUSTIN, *Commissioner, Forest, Fish and Game:*

SIR.—I beg to present herewith my report as Chief Game Protector for the fiscal year ending September 30, 1910. The tabulated statements appended show in detail the work of the protectors and also the returns from the sale of netting licenses, of hunting licenses, and the distribution of game birds from the State Game Farm, all of which matters have been under my supervision.

Referring to the summary of recoveries and expenses, it will be seen that the game protectors prosecuted a total of 1,496 cases during the past year, and procured a recovery for violations of fish and game laws of \$51,363.67. In addition to this the game protectors originated 38 actions for trespass on State lands, resulting in a recovery of \$6,999.10. This is the best showing ever made by the Department and indicates increased efficiency as a result of systematic organization and the following out of the principle that a game protector must do as good work for the State as would be expected of him if employed by an aggressive business corporation.

Owing to the dropping of inefficient men and other causes the number of protectors in actual service at any one time is never up to the maximum permitted by law, and during the past year the number of men actively employed was less than usual. Under these circumstances the record of cases shows an average of about 13 cases per protector, or one case per month for every man on the force during the year. When it is added that only about 5 per cent. of the cases handled were lost, it will be seen that the record of the protectors of the State of New York for 1910 is very commendable.

THE RATING OF DIVISIONS

The rating of the divisions shows a considerable change from last year. While the Southern Division under the direction of Llewellyn Legge (who since the termination of the fiscal year has been appointed Chief Game Protector) still leads the divisions of the State, no other division maintains a similar relative position with the exception of the Central New York Division which still ranks sixth. The largest gain has been made by the Metropolitan and Long Island Division, which has risen from the seventh position to the second; the Ontario Division has advanced from the fourth place to the third; the Southern Adirondack Division from the fifth to the fourth place; the Western New York Division from the eighth to the seventh place, and the Eastern Adirondack Division from the tenth to the eighth place. While the average cost of prosecuting each case was \$5.45 in 1910 against \$5.09 in 1909, the average recovery per case has risen from \$20.04 in 1909 to \$38.12 in 1910.

The principle followed in rating the divisions is to give an arbitrary marking for the average number of cases per protector, together with the average recovery per case and the average cost per case. Six points are credited to the division having the greatest average number of cases per man; three points to the division having the greatest average recovery per case, and one point to the division having the lowest average cost per case. It is fair to assume that the division whose protectors secure individually the largest number of cases is doing the most work and should be rated above the division whose protectors have been fortunate in securing a few large cases; this is the reason that six points are given to the division which shows the largest average number of cases per man. On the other hand, intelligent work in procuring a recovery large enough to be commensurate with the violation should not be overlooked and three points credit are therefore given to the division showing the largest average recovery per case. Finally the State is interested in having its cases tried at the lowest possi-

ble expense, in accord with good results, and for this reason one point is given to the division showing the lowest average cost in the prosecution of its cases. Experience has indicated that in no fairer way can the rating of the divisions be tabulated.

It has been found impossible in this rating to give suitable credit to the Adirondack divisions for results accomplished in top-logging cases and the procuring of evidence of trespass on State lands. From the results shown in another table, having to do with this branch of the protectors' work, it will be seen that the Adirondack Divisions, were this class of cases combined with their fish and game cases, would rank well toward the top. The comparison between the divisions, however, can only be made along the lines in which the protectors are all engaged in the same kind of work.

CHANGES IN ORGANIZATION

As the law stands at present the work of game protection is administered under the supervision of the Chief Protector, five Assistant Chief Protectors and four Division Chief Protectors. All of these men receive the same salary, with the exception of the Chief Protector and the First Assistant Chief Protector. The arrangement is an anachronism. Under the division system there should no longer be both assistant and division chiefs and the title "Assistant Chief" should be dropped. There should be a Chief Protector and a Deputy Chief Protector, whose headquarters would be at Albany, and 10 Division Chiefs, each one of whom would live at some place in the division of which he has charge. This plan would merely substitute a Deputy Chief Protector for the First Assistant Chief and add one Division Chief to the present force.

In the past six years the number of cases handled by the protectors has increased 400% and the division system of itself has greatly increased the work of the executive heads. The Division Chief, under the present system, receives weekly reports from his men and is in constant communication with them, directing them

in their work and advising them in the conduct of their cases; much of his time being spent in traveling over his division. While the position of Assistant Chief, under the old conditions, was something of a sinecure, under present conditions there are no harder worked men on the force than the Division Chiefs; therefore, I believe they should receive the same pay as the Fire Superintendents, viz., \$1,500 per annum. For the purpose of increasing the efficiency of the game protectors, each protector should have some financial incentive to spur him on to his best efforts. His work is hard and sometimes dangerous. The plan followed in some police departments of increased pay for continued service might be adopted with advantage. Each protector should understand that if he did not attain a certain percentage based upon cases and faithful service, he would be dropped from the force. On the other hand, he should be paid an increased salary after a certain period of service, and after twenty years he should be retired on half pay, just as is done in the New York police force. Protectors are now paid \$900 salary per annum. I think that after two years' service they should receive \$1,000, and have a raise of \$100 every other year thereafter until their pay is \$1,200. Any year of this period that a protector failed to make a fixed percentage, even though he qualified to remain on the force, should be disregarded as time counting for increased salary. Under this system, for at least six years and probably for a longer time the protector would be nerved to additional effort by the incentive of an increase in his salary. Beyond that period the incentive would come from the prospect of a pension after twenty years, which he could not gain provided he did not give good service.

The bane of all State work is half-hearted service. A State employee is apt to degenerate into a mere placeholder. A political job is a poor one at best; its tenure is uncertain, and chances of promotion are limited. The first step in making an effective game protective department is to take it as far as possible out of politics, and this has been achieved in this State by putting the protectors under competitive Civil Service. The second step should be to

create an incentive which would warrant a good return for well directed effort, and counteract the lethargic effect that is apt to overtake even the best man who holds a reasonably sure State job. A wise chief protector provided with a system of rewards such as above outlined could accomplish wonderful results with his men. The only thing required them would be some way of positively insuring good men in their tenure in office.

BUREAU OF INLAND FISHERIES

As a straight business proposition it would undoubtedly pay the State to establish a Bureau of Inland Fisheries, as a division of the Forest, Fish and Game Commission, with an executive officer to be known as the Superintendent of Inland Fisheries. The expense of such a bureau should not exceed \$5,000 per year and it is estimated that it would produce a revenue to the State of twenty to twenty-five thousand dollars annually. The bureau would have charge of all the commercial fisheries of the State not already cared for by the Bureau of Marine Fisheries. The chief business of the latter is the leasing of State oyster lands and it also looks after the lobster and other shell fish industries, and the menhaden and other salt water fisheries of the State.

The fresh water fisheries of the State, which are hardly of less importance, are now cared for by one clerk under the supervision of the Chief Protector, in a department already overburdened with work, and it is no reflection on this department to say that the revenue received by the State from this source is not what it should be. Lakes Ontario and Erie and the Hudson River have very important fisheries from a commercial standpoint, and there are many other inland waters that could be made to yield good returns. From this entire territory the State received in 1910 a revenue from the sale of netting licenses of but \$9,207.76. This is altogether too small an amount to be paid by existing fisheries. There is good reason to believe, moreover, that under proper supervision and suitable laws the revenue could be tripled or quadrupled, the increase coming chiefly from what are now neglected sources.

In many localities, where it is not now permitted, suckers, carp, eels, whitefish and some other varieties of non-game fish could be taken in such quantities as to be an important source of food supply, and under regulations that would not endanger the interests of the anglers. In fact, the netting of these fish would on the whole be of benefit to the increase of game fish. Most of the non-game fish are spawn eaters, while others make the water unfit for the survival of game fish. Many of the best angling waters of the State have been ruined by the advent of the carp, but, while despised by the anglers, the carp is a valuable fish from the commercial standpoint. This is illustrated by the fact that the carp fishery in the Hudson River today is the most important of any of the fisheries in that river, and it is stated that the value of the carp taken from the Hudson exceeds the value of all other fish commercially netted in that river. The carp is a wonderfully prolific breeder and grows to a great size in waters having the proper food requirements. It exists in many of the waters of the State where netting is not permitted and where for practical purposes it is never taken. Some of these waters contain no other fish of consequence and most of them would be benefited by the thinning out of the carp. The work would have to be done intelligently, however, and a suitable law would have to be framed to meet the situation; otherwise, great damage might result to the interests of the anglers of the State. The question is one which must be developed under the supervision of a practical man, in thorough sympathy with the angling interests. Under proper development the result could not fail to be of great value to all the people of the State. The food supply would be augmented and the State would receive an increased revenue. In this connection, I believe that the law which prohibits the netting of fish in Lake Ontario, aside from the waters of Jefferson County, should be amended so as to make the netting limit a half mile from shore instead of one mile. The half mile limit applies in Lake Erie while in a large portion of Jefferson County nets can be used

right up to the shore. The netting limit should be made uniform in the waters of the Great Lakes.

THE ADIRONDACK DEER SEASON

In some parts of the eastern and southern Adirondacks the subject is again being agitated of the return to a short hounding season. The argument is advanced that it would be much safer to human life to hound deer than to still hunt as under the present law. While I was at one time strongly in favor of hunting deer with dogs I have for some time been of the opinion that such a method of hunting is no longer practical in this State. A long hounding season would result in the extermination of the deer and a short hounding season would, I believe, be much more dangerous to human life than the present method of hunting.

A reference to the table of hunting casualties for the last six years, which is printed elsewhere, shows that during that time 16 men have been killed and 7 injured, who were mistaken for deer — a total of 23 casualties; while, during the same period, 33 men were killed and 29 injured as a result of carelessness or accident while engaged hunting other game. The average of men killed and wounded during the period covered by the table, who were mistaken for deer, is less than 4 a year, and in proportion to the number of hunters afield the percentage is probably no larger than at the time hounding was the legal method of hunting. Many sportsmen who recollect conditions when hounding was in vogue can recall accidents where persons were shot by being mistaken for deer. The following item from a late issue of *Forest and Stream* substantiates this statement:

“It will be noticed that the number of hunters killed or injured is very small in proportion to the great number of those who annually go afield. Particularly is this true as to deer hunting. In fact, it might well be said that these accidents form a negligible quantity in any argument that may rise as to this particular form of sport. Those who have been advocating a return to hounding

as a necessary preventive of deer accidents will scarcely be able to base their plea on the official figures. Indeed, it does not appear that the annual outcry as to deer hunting accidents has been justified, as it is very apparent that the popular idea as to the number of hunters killed or injured in any one year in this form of sport has been greatly exaggerated.

"The figures further show that by far the greater number of accidents occur among hunters of birds, duck, rabbits or other small game. Thirteen were killed and six injured during the past season in this wing of the army of sportsmen."

The hunting region of New York State is peculiar, in that it is convenient to the most densely populated section of the country. Similar conditions do not prevail in any other part of the United States. This State alone has a population of nine millions of people—one-tenth of the population of the entire Union—and our hunting sections are easily reached by almost as many more people. The population of the State has increased two and a half millions since hounding was last in vogue. More than 500,000 shot guns and rifles are annually sold in the United States and a considerable portion of these come every year to the hands of men who hunt in this State. It is this vast increase in the number of hunters rather than in the method of hunting which is the menace to human life in New York and in any other State where the hunters are grouped thickly. If such a thing was feasible no one should be granted a hunting license who could not show that he was at least familiar with the rudimentary principles of loading and handling firearms.

A short hounding season would result in an immense influx of sportsmen into the locality where it was permitted and there could hardly fail to be a considerable loss of human life, not so much from the fact that men would be mistaken for deer as from chance shots or the accidents which always result when a man careless with firearms is in the immediate proximity with a number of other men. The sportsmen who ask for hounding do not

realize how greatly the number of hunters has increased since this form of sport was last permitted by law.

On the other hand, even the advocates of hounding deem that this method of hunting would result in a larger number of deer being killed than are killed under the present law and that the present deer supply would not last long if an extended hounding season was permitted. Hounding is a method of hunting which has been found too destructive to the supply to be permitted in the Northern States. It is only where the number of hunters is limited and the hunting area large, as in the Province of Ontario, that those interested in the conservation of the deer can logically favor such a method.

The ideal game law is one so arranged as to season and method of hunting that no more than the increase of any game variety is killed during the open season so that a sufficient breeding stock is left over each year to maintain the supply. When this balance is seriously impaired the extinction of the game is only a matter of time. The sportsman therefore must consistently oppose any method of hunting which he believes will kill off the game more rapidly than it will increase under natural conditions.

Even a short hounding season would be a serious menace, in my opinion, to the deer supply. Not only would the number of deer killed by hunters have to be reckoned with but also the number of deer killed by the dogs. There are not many deer dogs in the Adirondacks at the present time. With hounding permitted their number would increase and there would be more dogs in the Adirondacks than ever before. The worse feature of hounding under old conditions was the number of deer killed by dogs permitted to run at large in the late winter and early spring. While most owners of hounds would undoubtedly keep their dogs tied up during the closed season some men would not take this precaution and dogs ranging the woods at the time when deer are weak — during the winter — would result in hundreds of deer being killed each year to the benefit of nobody.

The law is much better as it is. If any change is to be made I would recommend that the season be extended 15 days later than at present, with the proviso that no deer be killed except bucks with horns 3 inches or more in length. This would permit still hunting on the snow which would be bad, in that it would result in bringing a large number of hunters into the woods at this time. But such a law would have one good feature to recommend it, because the careless hunter would hesitate before shooting to ascertain whether the object of his aim was a deer with horns. There would be little danger of seriously encroaching on the breeding stock under the terms of such a law as the does would be protected. The experience of other states has shown that it benefits the stock to have the number of bucks reduced. Dr. T. S. Palmer of the Bureau of Biological Survey at Washington has stated that the heaviest deer come from states permitting the killing of bucks only, and his statement is substantiated by the record of weights given in the express companies' shipments.

Another point not to be overlooked when considering the merits of the two methods of hunting deer is the fact that the area inhabited by deer in this State has very materially increased since the prohibition of hounding. When hounding was permitted the deer in outlying sections, around the borders of the main forested areas, were easily driven out and killed and there were few deer aside from the supply in the heart of the wilderness. Today it is not a rash statement to say that there are more deer as a rule, around the outskirts of the woods than there are in the central portions and these deer are larger and better nurtured. It is probable that the range of deer in this State covers a greater extent of territory than at any time within the last seventy-five years. This is important from the sportsman's standpoint, in that it gives more men an opportunity of killing deer and also keeps the hunting parties more widely separated.

It is also likely that under the present law we have more deer in the State of New York today than, possibly, at any time during

its history. When wolves were numerous in the State the deer were never very abundant. Old Adirondack hunters stated that they traveled days at a time in winter without killing a deer, and without finding a deer's track that was not accompanied by a wolf track. Later on, before the advent of laws prohibiting market hunting and crusting, the sections inhabited by deer were ruthlessly hunted each winter by men who shipped out the venison as long as it was possible and afterwards killed for the hides only. It was not until modern game laws were adopted and enforced that the deer really had any fair show.

REGISTRATION OF DOGS

There is one injustice in the present hounding law which should be remedied. Some suitable amendment should be made which would permit the possession and use of dogs for legitimate purposes in the Adirondack section. The owner of a dog should, as at present, be held responsible if his dog pursues deer, but the farmer and the citizen who is not interested in hunting, also the bird shooter and fox hunter have rights which cannot be disregarded. These men are not law breakers but as the statute stands at present they are often made to suffer for the sins of the illegitimate hunter.

A proper system of registration of dogs would no doubt solve the difficulty. The law could be amended to permit the use of dogs for legitimate purposes in the forest preserve counties outside the Adirondack Park on the sole condition that such dogs be registered and have at all times tags, giving the registry numbers, attached to their collars. It should be made a misdemeanor and punishable by a fine of \$100 to permit a dog to run at large in the forest preserve counties without the tag attached as indicated. Such a law would give the game protector a much greater opportunity of securing convictions for violations of the hounding law than at the present time. Under present conditions the hardest kind of a case the protector has to make is a hounding case; his greatest

difficulty is to show in his evidence the connection between the hunters and the dogs. With the law amended as suggested when the illegal hunting was done the dog would undoubtedly be run with his collar off and no tag, and all that would be necessary to make a case would be to establish the identity of the dog, which is a much simpler proposition.

THE DEER SUPPLY

There can be no doubt that since hounding was stopped there has been a great increase in the number of deer in the State.

During the hunting season, which terminated October 31st, the express companies doing business on the Adirondack railroads transported twenty-three hundred and forty-three carcasses, saddles and heads of deer. This is the largest shipment ever made from the Adirondack section during a season when snow hunting was not permitted. 1896 was the last year in which hounding was permitted in the Adirondacks. Between that time and 1900 the deer season included the period from August 15th to November 15th. From 1900 to 1905 inclusive the open season was from September 1st to November 15th, inclusive. In 1906 the season was from October 1st to November 15th. In 1907 and 1908 the season was from September 16th to October 31st, inclusive, as it is at the present time. In 1909, however, fifteen days in November were added during which time bucks only could be killed.

It is interesting to note, from the table printed in another part of the report, the manner in which the number of deer killed, as indicated by the express shipments, has steadily increased. In 1900, with two months and a half open season and snow hunting permitted, only twelve hundred and four deer were shipped; and in 1901 only twelve hundred and eighty-six. By 1903 the two-thousand mark had been passed. In 1904, owing no doubt largely to the disastrous fires of 1903 and also to a bad winter, the number fell to eighteen hundred and ninety-four, but in both 1905 and 1906 there was a notable increase in the number killed. In the

latter season twenty-six hundred and twenty-three deer were shipped. Then the snow hunting was taken off and in 1907 and 1908 the number of deer shipped, respectively, was just under twenty-two hundred. 1909, with the fifteen days in November added, the record shipment of thirty hundred and twenty-five was recorded.

It will thus be seen that, aside from the poor season of 1904 (and making a proper allowance for seasons when snow hunting has been permitted) there has been a regular increase in the number of deer killed each season.

This is as might be expected in a State whose population has increased one quarter in ten years. Were it not for the fact that the area inhabited by the deer is much larger than it was when hounding was permitted, the future of the deer supply would be seriously menaced. It is probable that at least four times as many deer are killed in the State as are transported by the express companies from the Adirondacks. Only a very small proportion of the deer killed, in the territory around the big woods, are shipped by rail. With the annual kill around the ten thousand mark and with the steady ratio of increase that now obtains, it is only a question of time when more restrictive regulations must be adopted.

STATE GAME BIRD FARM

The State Bird Farm, which has been in operation a little over a year, has sent out about 1,200 pheasants for stocking purposes and sixty-five hundred eggs. These eggs and birds have gone into every county in the State. Three thousand eggs were used for hatching at the farm, from which two thousand birds were reared to maturity. Six hundred breeding birds are retained at the farm, also twenty-five pairs of English partridge and ten pairs of quail. The pheasants reared on the farm include the English ring neck, the Mongolian and the Hungarian dark necked pheasants.

In addition to the work of propagating the game birds, Harry T. Rogers, manager of the bird farm, has himself done a large

share of the work of fencing the farm and of building the various pens and enclosures required for the operation of the enterprise. Seventy-five movable breeding pens, twelve by sixteen feet in size and six feet high, have been built; also two hundred and fifty individual coops and two hundred and fifty wire screens, which are used in the rearing of the small birds. Two large fields have been enclosed by wire fences nine feet high; one of these fields is ten acres in extent and is used for the breeding birds; the other comprises eighty acres and is used for the young birds.

The farm has been run economically. It has produced most of the grain used by the birds. During 1910 the farm produced one hundred and twenty-one bushels of buckwheat, forty bushels of wheat, three hundred and seventy-two bushels of oats and five hundred bushels of shelled corn.

Mr. Rogers has accomplished much by hard and diligent work. The condition of the farm has been improved, the buildings repaired, and a modern plant for the rearing of game birds fully equipped; and this result has been accomplished with a saving of three thousand dollars in the amount appropriated for the bird farm. Next year from three to four times as many birds and eggs will be shipped as in 1910.

PHEASANTS IN NEW YORK

The fact that at the present time there is shooting for pheasants in sixteen counties in the State is chiefly due to an earlier experiment of the Forest, Fish and Game Commission in raising and distributing these birds for stocking purposes. For six years prior to 1904 the State sent out an average of something less than two hundred birds per year to applicants in various counties. Of these birds Monroe county received one hundred and thirty-five, which was the largest number apportioned to any county; next in order was Steuben, which received seventy-nine, Jefferson seventy-six and Niagara seventy-one. The total number of birds sent out in the six years was less than the number sent out from the State Bird Farm at Sherburne during

its first year of operation. Livingston county was stocked chiefly by the Wadsworths, who turned down a large number of birds on their extensive holdings.

Reports from the principal counties, where pheasant shooting is permitted by law, indicate that the birds are constantly increasing in numbers, despite the fact that large numbers are annually killed by sportsmen. In some sections of the State the farmers have been prejudiced against the pheasant on the ground that it damaged farm crops. "The Rochester Democrat," of October 20th, under the heading "Pheasants Are Increasing," notes a change in the sentiment of farmers in Monroe county in this respect. The editorial states "Sportsmen who have taken advantage of the open season for Chinese pheasants are reporting fair success, but are to a degree hampered by the posting of large numbers of farms by their owners. The farmers, it appears, have many of them changed their minds regarding the pheasants. It is not long since many complaints were made that the Chinese pheasant was an enemy of the agriculturist and an active agent in the destruction of crops. Now that it has been learned that the bird is more useful than injurious, 'no trespass' signs are everywhere in evidence. Under these conditions there is very little likelihood that the birds will be exterminated. In fact it is reported that they are more numerous, in spite of last year's open season."

As pheasants are quite likely to be the important game bird of the future in this State, the question of their value to the farmers deserves careful attention. Some of the farmers' papers condemn the pheasants roundly, stating that they will pull newly-planted corn and later on rob the corn fields when the ears have ripened. They also state that they destroy apple buds and pick into mature fruit. It is believed that these reports greatly exaggerate the damage done. On the other hand considerable evidence is available to show that the pheasant is a friend of the farmer. The two following extracts are taken from the "Rural New Yorker": "As a person who is a great admirer of the pheasant and who hopes eventually to see them rank as our foremost game bird, I beg

to put in a word in their favor. I can do no better than to quote W. B. Tegetmeier, the author of 'Poultry' in the Encyclopedia Britannica, and a very well-known judge of poultry and pheasants in England * * * He says: 'The value of pheasants to the agriculturist is scarcely sufficiently appreciated; the birds destroy enormous numbers of injurious insects — upwards of twelve hundred wireworms have been taken out of the crop of a pheasant; if this number was consumed at a single meal, the total destroyed must be almost incredible. There is no doubt that insects are preferred to grain. One pheasant, shot at the close of the shooting season, had in its crop seven hundred and twenty-six wireworms, one acorn, one snail, nine berries and three grains of wheat. Mr. F. Bond states that he took out of the crop of a pheasant four hundred and forty grubs of the crane-fly or daddy-long-legs. These larvæ are exceedingly destructive to the roots of grass on lawn or pasture. As another instance of their insectivorous character may be mentioned, the complaint of Waterton, that they had extirpated the grass-hoppers from Walton Park.' * * * H. S. Gladwin."

Another letter reads as follows: "I am glad to submit to you our estimate of the value of pheasants. We have raised them in the barnyard, and from close observation have found that insects and bugs are their natural food. For this reason, they are of inestimable value in the orchards, where they do absolutely no harm. We have a corn field in close proximity to the orchards. There we have observed crows, blackbirds and doves pulling the corn, but we have never seen a pheasant. We are breeding them this winter, not because we want a game preserve, but because we want these useful birds to make their homes in our orchards." * * * F. C. Pultneyville, N. Y.

The following is taken from the "Rochester Democrat:"

Lyons, N. Y., July 19th, "Five English pheasants will pick and destroy more potato bugs in a day than any farmhand that ever lived," says William N. Myers, and he ought to know, as he has tested both plans for exterminating this pest. Mr. Myers has a

truck farm at Pilgrimport. Adjacent is a piece of woods in which there are lots of pheasants. Mr. Myers noticed about two weeks ago that the pheasants were paying great attention to his potato patch. Knowing that pheasants can pull corn faster than two men can plant it, he was naturally suspicious and inspected the field closely to see that the birds did not dig up the potatoes by the hill. Aided by a pair of field glasses, Mr. Myers saw that the pheasants were not after the potatoes but were eating the bugs. A week ago Mr. Myers ran upon a flock of young pheasants. He hastily built a wire fence around a small portion of the potato lot and put the flock of six young pheasants in the enclosure. That flock cleaned the potato bugs off in short order. He next removed the fence altogether and noticed that the birds hankered so much for the juicy bugs that he did not have to invite them to work. Consequently Mr. Myers is saving his money, while other farmers are buying paris green, and his potato lot has but few bugs in it."

The "Canandaigua Repository" for October 28th, in reporting on the Ontario pheasant season, says: "What is said to have been the most successful pheasant season, from the hunter's point of view, since the revision of the game laws, will close to-morrow * * * When pheasants were more numerous in the county farmers and property-owners generally pronounced the birds to be destructive. This view seems to have changed considerably and now it is declared that, although the birds do some damage when the crops are coming up yet their continual warfare against harmful insects more than makes up for the damage."

SMALL GAME.

The season of 1910 was an exceptionally good breeding season for birds and small game in most parts of the State. In localities where the breeding stock had not been exterminated there was a gratifying increase in the number of partridge. The number of sportsmen have increased so greatly however, that, except in the most sparsely settled sections of the State, the outlook for this noble game bird is most gloomy.

Rabbits, including the cotton tail and the varying hare — often called the white rabbit — were more numerous than for a number of years past. Gray squirrels were also abundant in many sections of the State. One Italian arrested on the north shore of Long Island had thirty-four in his possession.

THE CARE OF THE STATE GAME.

The owners of private preserves spend considerable sums of money in caring for the game they have in their covers, and it is good judgment on the part of the State to do the same. Game protection for which the State spends large sums annually avails little if applied only to destroyers of the human race. Encouragement should be given to keeping down noxious vermin, and game should be cared for in winter when in danger of perishing by starvation.

A modest appropriation should be available for supplying feed for the deer in sections of the Adirondacks where deer die during hard winters, and this should be available also for the care of pheasants or other game varieties. Each deer has a considerable money value, if considered only from the standpoint of the price the carcass will bring in a butcher shop, and no private corporation would consider it good business to lose valuable stock when a few dollars properly expended at a crisis would save the supply.

WOLVES IN THE ADIRONDACKS.

The following letters from D. C. Wood, the well-known Adirondack surveyor, and Charles Donaldson are self-explanatory:

“We were at work on the west line of township fifty and I was searching for the line ahead of the party when I scared up an animal which I at first thought was a fawn, but upon closer examination saw that it was not. It was about the size of a shepherd dog and gray in color. I spoke to one of my men who was with me and he said, ‘it acted like a wolf and if it was we would see it again as they usually sneaked around to watch anybody.’ In

about fifteen minutes I ran on to it again and it ran off. Again in about fifteen minutes I was in advance, sitting up a fallen spruce tree waiting for the men to come up. When they came up to the top of the fallen tree this animal jumped out from under the top and ran away. It apparently was hidden there watching me. Mr. Donaldson, the ax-man, was within about fifteen feet of it and obtained a good view of it and said, 'it was a wolf.'"

D. C. WOOD.

"Mr. Wood saw the wolf first and he did not know what it was and he came and told me about it and I told him I thought it was a wolf and told him that if it was a wolf he would see it again, as it was the nature of those kind of animals to sly around and watch anybody that they saw. We surveyed on a piece and Mr. Wood and the chainman saw him again and then he ran off in the woods and we went on farther and I saw him. He was standing at one end of a tree top and Mr. Wood was standing at the other end and he was watching Mr. Wood and then I showed him to Mr. Wood and his son. I knew it was a wolf as I have seen them before. A wolf has four toes and I think there are more wolves in there as I saw a number of tracks of wolves when they had crossed the small streams of water that run up in there."

CHAS. DONALDSON.

ELK AND WILD BOAR.

The Adirondack elk appear to be steadily decreasing in numbers, despite the fact that they seem to be well able to take care of themselves in so far as the question of feed is concerned. The yearling elk resemble deer and are often unintentionally shot by hunters who mistake them for deer. The experiment of attempting to restock the Adirondacks with elk has been an interesting one, but for the reason above given is likely to result in failure.

There are a number of wild boars at large in various parts of the State, and in some sections they appear to be increasing in numbers. In the Adirondacks they forage under the snow and

appear to have little difficulty in getting food in winter. Wild boar which escaped from the Litchfield preserve now occupy a considerable extent of country in the neighborhood of the southern end of Big Tupper lake. It is by no means unlikely that the animal which Messrs. Wood and Donaldson saw north of Long lake, and which they took to be a wolf as mentioned elsewhere, may have been a small boar. In color and general appearance a yearling wild boar, when seen in the woods, is not unlike a wolf.

BEAVER IN NEW YORK.

One of the most interesting facts with reference to the wild animals of the State is the rapid increase of beaver. For a number of years prior to 1904 it was commonly believed that beaver had been exterminated in the State. As a matter of fact, however, a small remnant of the once abundant native stock still survived. The last stronghold of these beaver was the lake region in township twenty, south and west of St. Regis mountain. A few beaver were on the west branch of the St. Regis river and a few on the Jordan river, which empties into the Raquette river in the town of Hollywood, St. Lawrence county; in all there were probably not more than a score of beaver left.

In 1904, through the efforts of Harry V. Radford, an appropriation was secured from the Legislature of \$500 for the purchase of beaver for the purpose of restocking the Adirondacks. In the spring of 1905, six beaver, which had been secured from the Canadian Exhibit at the Louisiana Purchase Exposition at St. Louis, were released, two at the junction of Sumner stream with the south branch of the Moose river and four at the head of Big Moose lake. In 1906 fourteen more beaver, procured from the Yellowstone National Park by arrangement with the Secretary of Interior, were liberated. Four of these were released in a pond near First lake of the Fulton Chain, four near the Fourth lake of the Fulton Chain, four on the outlet of Lake Terror in township forty-two, and two near the head of Little Tupper lake. In 1909, the State also released a beaver at Lake Placid. In all the State released twenty-one beaver.

In addition to the beaver put out by the State a number were released by private individuals. Beginning in 1901, Edward H. Litchfield has liberated in all about a dozen beaver in the neighborhood of his preserve on Big Tupper lake. In 1902 a beaver escaped from Woodruff's preserve at Lake Kora and took up its residence at the mouth of Sumner stream, where, as above stated, two of the State beaver were released in 1906. In 1906, Hon. George A. Stevens liberated a Canadian beaver at Lake Placid.

Near Huguenot, in Orange county, on Cold brook, between the Ontario & Western railroad embankment and the Neversink river, is a colony of beaver on the land of Mr. A. E. Godefroy. There is also a second colony of beaver in the same neighborhood on the land of Benjamin Swartout on the Neversing river. Mr. Godefroy for several years past has notified the Commission from time to time of the welfare of the beaver, and Acting Division Chief Kidd has posted the localities. It is difficult to imagine where these beaver came from unless they are the offspring of beaver originally released in the preserve of Rutherford Stuyvesant at Al-lamuchy, N. J., which place is about thirty-five miles in an air line from the colonies just mentioned.

Some years ago the Forest, Fish and Game Commission had notices printed giving the terms of law under which the beaver are protected and warning persons not to interfere with them. The game protectors have posted these notices in all localities in the State where beaver are known to inhabit.

All told the Commission has information of about sixty families of beaver over a widely scattered region, chiefly of course in the Adirondack section. They are breeding rapidly, the law protecting them is respected and they will soon be a common sight in the northern part of the State.

RETURNS FROM HUNTERS' LICENSES.

During the last fiscal year the returns from hunters' licenses were \$141,219 as against \$134,031 for 1909. Suffolk county again leads the other counties of the State in the number of licenses issued.

It is interesting to note that in the three years that general hunters' licenses have been issued two counties of less than 100,000 population have led the other counties of the State; these are Suffolk, which has twice stood at the head of the list and once in second place, and St. Lawrence, which has once occupied the first position and twice the second place. Next to these counties Erie and Monroe have contested for the honors.

CHANGES IN THE LAWS.

At the last session of the Legislature several important changes were made in the game laws and a number of minor ones. In all thirty-nine sections were amended and one new section added. The new section added to the game law is section 32-a, which gives power to the Commissioner upon the request of a majority of any town board, to designate as game or bird refuges, for a period not to exceed ten years, lands set aside with the consent of the owners for this purpose. No hunting whatever can be done upon these refuges.

The duck shooting season was lengthened ten days to January 10th, while the time allowed for the possession of State ducks was shortened six weeks, or to midnight of January 15th. A bonding provision was added permitting bonded dealers and hotels to sell wild fowl from out of the State between January 10th and March 1st. The Long Island brant law, which gave a special season for brant extending four months beyond the regular wild fowl season and which was the cause of much illegal shooting of ducks, was repealed.

The Shea bill, which was the measure advocated by the National Association of Audubon Societies, was enacted into law. This bill amended section 98 so as to make the prohibition against the sale of the plumage, skin or body of any bird protected by the section apply also to birds coming from without the State, as well as to State birds, provided that the foreign birds belong to the same family as the native birds which were protected.

That part of the deer law giving the first fifteen days in November as a special open season for buck deer was repealed. The open season for muskrat was extended from March 15th to April 15th. A three year close season for Long Island deer was established. The prohibition against the use of ferrets for hunting rabbits was removed, and a bag limit of ten rabbits per day to one person was added.

The penalty for polluting streams and for taking fish, by drawing off the water and also by the use of explosives, was materially increased.

The force of game protectors was increased from eighty-five to ninety. The salary of the First Assistant Chief Protector was raised \$200, and the Division Chiefs given the same salary as the Assistant Chiefs ranking below the First Assistant Chief.

THE ENFORCEMENT OF THE LAW.

Some of the leaders of the organized sportsmen of the State believe that the enforcement of the game law has been too severe. The statement is made that the game protector should devote his energies to prevent violations of the game law and not to the prosecutions of the violators. It is said that the protector, under the present system, is judged too much by his record of cases, and that better results would be obtained if he was instructed to make few if any arrests but to warn the violators of the law and to hold his evidence of violations over their heads as a threat to make them mend their ways.

While plausible in theory such a program is highly impractical. Prosecuting people for violations of the law is not pleasant business. The game protector is human, and would naturally welcome an excuse to be rid of the most troublesome part of his work. The result could not fail to be loss of discipline and demoralization in the force and increased game law violation.

The attitude which the Commission takes upon this matter, and the only attitude which it can take, is that where a violation of the law has been committed the penalty must be met. There is no

way of getting around it. Once the Commission is satisfied that any provision of the game law has been violated that part of the incident is closed. No power is given the Commission to waive any provision of the law whatever where the law has been infringed. When a violation is of minor importance and purely technical the courts decide this fact, but when any of the plain provisions of the statute has been violated the Commission itself has but one interest and but one duty, and that is to see that the matter is taken to the courts where suitable justice may be rendered.

In many respects the game laws are arbitrary and unjust. No man-made law was ever perfect or can be perfect. The best law is the law which works the greatest good with the least injustice. The game protectors are instructed to devote their chief energies to the suppression of flagrant violations, but they are not permitted to overlook any violations of the law.

A fact that impresses visitors from other countries, in noting American customs, is American disregard of law. No people on the face of the earth, and I say it with all due reverence for this wonderful nation of ours, are more reckless in passing laws and then failing to enforce them. We have laws against gambling and Sunday drinking (not to mention game laws), which are violated every week by pretty good kind of people just for the fun of it. This is all wrong and we know it. Every thinking man to-day believes in fewer laws and an exact enforcement of them.

JOHN B. BURNHAM.

REPORT OF THE CHIEF GAME PROTECTOR

Regular Protectors

	Actions brought	Recovery	Court costs	Constables' fees	Attorneys' fees	Other charges	Total costs
Leavitt, J. E., second assistant chief.....	7	\$231 50	\$9 15	.....	.....	.....	\$9 15
Nichols, R. B., third assistant chief.....	3	150 00	2 30	.....	.....	.....	2 30
McCollow, B. H., fourth assistant chief.....	1	25 50	50	.....	.....	.....	50
Legge, L., division chief.....	22	380 85	10 85	\$1 80	\$10 00	.....	22 65
Dorton, E. A., acting division chief.....	5	1,731 56	12 40	.....	164 50	.....	176 90
Kidd, W., acting division chief.....	13	122 50	26 20	41 92	.....	.....	68 12
Vosburgh, I., acting division chief.....	7	329 30	17 20	28 40	75 52	.....	121 12
Ball, J. E.....	7	96 20	7 30	16 80	.....	.....	24 10
Barnes, C. T.....	1	100 00	.....	.....	.....	.....	.....
Beebe, C. A.....	15	330 00	22 30	6 30	.....	.....	28 60
Birch, E. J.....	8	192 50	8 10	.....	.....	.....	8 10
Bower, S. E.....	6	160 00	5 65	3 00	.....	.....	8 65
Boyd, S.....	13	234 00	10 57	2 00	5 00	.....	17 57
Broderick, J. W.....	18	260 00	28 35	3 20	45 00	.....	76 55
Burhans, E.....	7	36 00	28 90	.....	20 00	.....	48 90
Burnside, L. H.....	14	184 05	19 65	13 70	28 00	.....	61 35
Burnett, W. H.....	11	318 70	9 10	.....	4 00	.....	13 10
Cloyes, W. D.....	16	139 25	16 80	16 46	15 00	\$5 00	53 26
Colloton, J. A.....	13	1,059 96	13 10	10 40	518 51	.....	542 01
Culver, C. C.....	17	294 30	24 88	8 30	.....	.....	33 18
Daugherty, E. J.....	8	116 10	16 95	5 40	.....	.....	22 35
Dewolf, H. C.....	10	169 00	13 50	.....	.....	.....	13 50
Doty, W. J.....	14	170 47	51 07	43 70	70 15	.....	164 92
DoVille, C. T.....	10	198 00	12 40	5 95	16 00	69	35 04
Farley, W. C.....	42	833 55	55 87	22 80	15 00	.....	93 67
Farnham, P. S.....	31	795 85	32 85	4 00	35 00	.....	71 85
Featherston, I. E.....	15	369 30	36 05	23 35	30 00	.....	89 40
Ferguson, A. C.....	12	198 75	20 75	3 85	.....	.....	24 60

Regular Protectors — (Concluded)

	Actions brought	Recovery	Court costs	Constables' fees	Attorneys' fees	Other charges	Total costs
Ferree, W. D.	17	\$339 40	\$20 05	\$8 55	\$90 18	.....	\$118 78
Gallagher, E.	22	630 00	.....	.....	119 00	.....	119 00
Geenan, E.	9	93 45	6 45	.....	45 00	.....	51 45
Grant, R. H.	13	358 25	26 60	27 10	.....	.....	53 70
Grenon, J. P.	4	89 50	21 28	16 60	10 00	.....	47 88
Haff, H. P.	18	688 55	51 25	15 40	15 00	.....	81 65
Hand, J.	8	284 00	18 25	4 75	100 50	.....	123 50
Hayes, J.	5	232 40	8 50	2 00	.....	.....	10 50
Hazelton, M.	39	513 70	41 50	2 00	13 00	.....	56 50
Hazen, E. A.	9	272 00	14 50	.....	5 00	.....	19 50
Helms, D. G.	2	51 00	1 50	.....	.....	.....	1 50
Hicks, E.	26	1,720 00	.....	.....	285 00	.....	285 00
Hincher, T.	15	306 10	66 45	27 25	75 00	14 75	183 45
Hodge, W. C.	16	243 50	2 00	1 00	5 00	.....	8 00
Hoffman, F.	3	15 00	2 00	.....	25 00	.....	27 00
Horton, H. A.	10	80 00	29 15	25 65	20 00	.....	74 80
Irons, W. H.	19	422 97	17 95	4 85	5 00	.....	27 80
Jones, E. R.	6	215 25	13 80	10 75	20 00	.....	44 55
Kinsman, E.	6	185 50	5 50	.....	.....	.....	5 50
Knapp, W. H.	2	31 00	1 00	.....	.....	.....	1 00
Lakin, L. S., Jr.	2	.....	14 80	11 25	20 00	.....	46 05
Leavitt, W. J.	7	45 00	11 50	4 50	.....	.....	16 00
Lee, C. E.	6	452 95	21 15	19 60	55 00	36 29	132 04
McCormick, J. T.	12	552 50	.....	.....	124 50	.....	124 50
Martin, E.	21	195 60	16 15	4 50	10 00	10 00	40 65
Marsh, T.	5	82 50	2 50	.....	.....	.....	2 50
Mattison, S. G.	19	426 50	15 20	4 20	99 20	.....	118 60
Moore, A.	7	270 00	10 50	5 00	.....	.....	15 50
Noble, G. R.	4	52 00	10 05	14 40	10 00	.....	34 45
Norton, D.	13	153 00	22 50	10 20	10 00	.....	42 70
Northrup, J.	10	215 00	17 00	.....	.....	.....	17 00

Overton, E. R.	4	71 00	6 00	.....	.....	.....	.....	.....	6 00
Philbrick, B. W.	6	70 00	1 98	.....	.....	.....	.....	.....	1 98
Piersall, S.	1	.....	7 05	.....	.....	.....	.....	.....	17 10
Reed, W. L.	17	270 10	44 40	3 00	7 05	.....	.....	.....	147 86
Reynolds, E. H.	15	442 95	48 35	63 46	40 00	.....	.....	.....	412 79
Rice, J. G.	8	160 00	23 05	67 45	296 99	.....	.....	.....	44 55
Riley, C.	10	188 00	5 50	11 50	10 00	.....	.....	.....	5 50
Sargent, W. S.	9	217 00	7 00	.....	.....	.....	.....	.....	7 00
Sauter, J. V.	18	1,197 95	2 95	.....	414 60	.....	.....	.....	417 55
Scott, N. A.	17	301 45	27 71	.....	20 00	.....	.....	.....	47 71
Scott, S. S.	13	209 85	25 20	5 25	.....	.....	.....	.....	30 45
Seckington, D. W.	17	340 23	27 05	3 95	30 00	.....	.....	.....	61 00
Smith, J. R.	13	410 00	6 82	.....	.....	.....	.....	.....	6 82
Somerville, R.	10	295 60	24 45	2 75	.....	.....	.....	.....	27 20
Speenburgh, D. C.	27	469 40	24 95	9 20	91 95	.....	.....	.....	126 10
Squires, C. A.	7	97 00	14 00	1 00	15 00	.....	.....	.....	36 15
Stanyon, F.	19	809 65	20 15	.....	.....	.....	.....	.....	30 75
Stapley, C. R.	39	562 75	30 75	.....	.....	.....	.....	.....	9 60
Sutton, G. E.	5	35 00	8 00	.....	.....	.....	.....	.....	206 01
Tarbell, N. B.	11	309 00	115 50	.....	144 41	53 60	.....	.....	201 45
Thompson, H. H.	28	572 95	22 75	10 95	75 00	.....	.....	.....	92 05
Vann, J. B.	22	873 55	28 10	19 30	50 00	.....	.....	.....	104 40
Warren, R. E.	22	508 65	13 80	38 80	33 00	4 50	.....	.....	26 05
Weed, W. J.	10	153 75	69 00	2 35	10 00	.....	.....	.....	80 29
Weston, W. H.	34	815 55	4 05	10 80	.....	49	.....	.....	4 70
Williams, A. P.	6	1,050 95	15 05	65	.....	.....	.....	.....	15 05
Willis, J.	16	337 05	59 15	.....	52 82	.....	.....	.....	113 97
Winch, C.	6	176 75	4 95	2 00	.....	.....	.....	.....	4 95
Winslow, A.	8	117 00	25 50	.....	59 40	.....	.....	.....	90 70
Wolf, O. C.	25	404 50	24 52	5 80	.....	.....	.....	.....	24 52
Worden, C. G.	26	801 15	.....	.....	.....	.....	.....	.....	.....
*Department	3	14,000 00	.....	.....	.....	.....	.....	.....	.....
Total	1,173	\$44,712 59	\$1,749 15	\$738 99	\$3,575 28	\$125 32	\$6,188 74	.....	.....

* Prosecuted direct from office.

Special Game Protectors and Others

	Actions brought	Recovery	Court costs	Constables' fees	Attorneys' fees	Other charges	Total costs
Allen, C. C.	2	\$26 00	\$8 50	.....	.....	.....	\$8 50
Ames, G.	3	42 50	2 50	.....	.....	.....	15 35
Anderson, F.	1	.....	1 35	\$12 85	.....	.....	3 35
Anson, B.	23	595 75	17 85	2 25	\$10 00	.....	30 10
Ashton, H. T.	1	10 00	1 45	.....	.....	.....	1 45
Babcock, H. S.	2	21 10	1 10	.....	.....	.....	1 10
Bardo, L.	12	149 90	27 45	2 00	10 00	.....	39 45
Beakle, J. E.	1	25 50	50	.....	.....	.....	50
Bemus, H. C.	3	.....	7 00	9 25	.....	.....	16 25
Blunck, J.	1	25 25	25	.....	.....	.....	25
Bradley, F.	2	35 00	5 00	.....	.....	.....	5 00
Brigham, C. E.	8	713 20	9 85	7 20	.....	.....	17 05
Brigham, F. E.	1	10 40	40	.....	.....	.....	40
Bundenthal, W. H.	10	330 45	19 45	1 00	.....	.....	20 45
Bunselmeyer, W.	1	15 00	.....	.....	.....	.....	.....
Burns, A. J.	1	25 00	.....	.....	.....	.....	.....
Cain, E. R.	2	.....	6 05	2 80	.....	.....	8 85
Carnan, J. McE.	1	10 00	2 95	.....	.....	.....	2 95
Coe, J. C.	2	20 00	3 00	5 20	.....	.....	8 20
Cole, D. W.	1	10 00	.....	.....	.....	.....	.....
Con, H.	6	104 00	8 85	10 65	.....	.....	19 50
Cooper, J. R.	2	20 00	3 00	.....	.....	.....	3 00
Conner, W. H.	1	12 75	75	.....	.....	.....	75
Cowell, W. E.	1	50 00	.....	.....	.....	.....	.....
Dillenbeck, G. W.	3	38 50	1 00	.....	.....	.....	1 00
DuBois, A.	3	62 00	6 30	5 60	.....	\$0 08	11 98
Edwards, J.	2	.....	10 40	.....	.....	.....	10 40
Enrod, W. H.	1	15 00	.....	.....	.....	.....	.....
Farmer, H. M.	1	61 50	1 50	.....	.....	.....	1 50

Fennelly, P.	20 00	3 50	4 90	8 40
Fenstamacher, D. W.	10 00	3 50	4 90	60
French, H.	30 00	60		6 65
Freaner, F.	25 00	3 00	3 65	12 95
Gage, A. M.	90 00	8 00	1 95	41 35
Gauding, E. W.	35 00	17 15	9 20	50
Graham, J. G.	50 00			1 00
Griswold, F.	10 50	50		72 88
Guiles, G. A.	11 00	1 00		2 60
Hamilton, F. W.	472 88	19 75	53 13	2 50
Hogland, W. L.	86 10	2 60		2 00
Hohman, J. H.	37 50	1 00	1 50	
Issendorf, G. W.				
Johnson, F. E.	116 50	2 00		
Jones, A. V.	120 00			
Keating, P. J.	15 00	2 30	1 35	3 65
Kernaghan, W. S.	20 00	1 50		1 50
Kippenly, C. S.	10 00	2 50		2 50
Kleisworth, J.	25 00	6 65		6 65
Knobloch, P.	62 30	2 30		2 42
Knowles, A. G.				
Koch, A. G.	110 00	16 95	39 20	56 15
Kyser, J.	50 00			10 00
Leonard, F.	50 00	6 20	17 40	23 60
Lewis, F.	97 50	4 50		4 50
Liddle, J.	55 00	7 00		7 00
Littlefair, F. B.	11 00	1 00		1 00
Lodge, C. H.	42 25	2 25		2 25
Loughren, J.	10 00	2 60		2 60
Loweree, J.	15 00	2 95	1 90	4 85
McIntyre, L.	73 25	3 25		3 25
Maloney, F. J.	63 00	2 00		2 00
Mandigo, J.		8 00	15 95	37 95
Minard, J. G.	10 00	1 85		1 85
Moak, J. E.	20 00	2 80	1 95	6 75
Moffatt, J. B.	56 35	40 15	31 40	71 55
Moody, H.	15 00	3 60		3 60

Special Game Protectors and Others — (Concluded)

	Actions brought	Recovery	Court costs	Constables' fees	Attorneys' fees	Other charges	Total costs
Moon, J.	2	\$110 00	\$2 00	.....	.....	.....	\$2 00
Morse, W. J., Jr.	16	230 00	29 20	.....	.....	.....	29 20
Munson, F.	2	.....	14 00	\$24 80	.....	.....	38 80
Murray, H. S.	5	79 00	5 50	.....	\$4 50	.....	10 00
Nevin, J. P.	1	10 00	2 40	.....	.....	.....	2 40
Newell, E. T.	2	20 25	25	.....	.....	.....	25
Oliver, H.	2	55 00	6 45	.....	12 00	.....	26 35
Nohowee, W.	1	12 95	2 95	7 90	.....	.....	2 95
Pitts, F. E.	1	50 00	1 00	2 00	.....	.....	3 00
Poole, R. B.	3	125 75	.....	.....	17 00	.....	17 00
Porter, C. A.	1	25 00	.....	.....	.....	.....	.....
Pross, J. J.	1	10 00	2 75	.....	.....	.....	2 75
Radford, W. B.	1	26 00	1 00	.....	.....	.....	1 00
Riley, R.	8	95 00	11 00	10 35	.....	.....	21 35
Rinehart, R.	3	31 00	1 00	.....	.....	.....	1 00
Robinson, W. C.	6	81 80	12 70	4 40	.....	.....	17 10
Rose, J. J.	2	50 00	.....	.....	.....	.....	.....
Rutherford, W. S.	11	181 00	9 25	6 75	.....	.....	16 00
Salisbury, J. E.	1	10 00	3 25	3 80	.....	.....	7 05
Schmidt, F.	5	87 65	11 70	.....	6 00	\$0 15	17 85
Sisson, F.	1	10 00	.....	.....	.....	.....	.....
Smith, C. J.	1	26 70	1 25	.....	.....	45	1 70
Smith, E. G.	1	25 00	3 90	.....	.....	.....	3 90
Smith, G. D., Jr.	1	10 00	3 65	.....	.....	.....	3 65
Smith, R. F.	2	25 00	5 90	10 20	15 00	.....	31 10
Smith, W. K.	9	138 55	12 90	4 25	.....	.....	17 15
Spain, L. J.	2	41 40	6 50	.....	10 00	.....	16 50
Squier, S.	2	30 50	50	.....	.....	.....	50

Stark, J. F.....	5	120 00	5 00	.....	.....	.....	.....	.....	5 00
Sweet, O. W.....	2	20 00	4 05	.....	.....	.....	.....	.....	8 70
Temple, A. S.....	3	11 00	7 00	.....	.....	.....	.....	.....	43 60
Viele, F. P.....	9	45 00	12 00	.....	.....	.....	.....	.....	12 00
Wagar, H. H.....	1	81 65	3 60	.....	.....	.....	.....	.....	6 65
Walroth, W. W.....	2	75 00	6 20	.....	.....	.....	.....	.....	18 05
Warren, F. D.....	5	157 25	5 75	.....	.....	.....	.....	.....	6 23
Weichbrodt, F. A.....	5	39 70	9 70	.....	.....	.....	.....	.....	19 70
Williamson, J. A.....	1	25 00	5 95	.....	.....	.....	.....	.....	5 95
Wright, J.....	1	25 00	2 25	.....	.....	.....	.....	.....	4 80
Total.....	323	\$6,551 08	\$538 40	\$304 30	\$208 63	\$4 28	\$1,055 61		

Summary of Recoveries and Expenses

	Fines and Penalties	Expenses of prosecution
Regular protectors.....	\$44,712 59	\$6,188 74
Special protectors and others.....	6,551 08	1,055 61
Total.....	\$51,363 67	\$7,244 35

Summary of Results of Actions Brought

	Regular protectors	Special protectors, etc.	Total
Fined.....	1,030	278	1,308
Sent to jail.....	30	4	34
John Doe proceedings.....	31	4	35
Sentence suspended.....	27	15	42
Acquitted.....	37	12	49
Discontinued.....	6	6	12
No cause.....	11	.....	11
Jury disagreed.....	1	4	5
Total.....	1,173	323	1,496

DIVISION	Number of men in division	Total number of cases	Average number of cases per protector	Gross recovery	Average recovery per case	Total cost	Average cost per case
Southern division, L. Legge, division chief protector.....	11	227	21	\$4,623 65	\$20 32	\$590 93	\$2 16
Metropolitan and Long Island division, E. A. Dorlon, acting division chief protector.....	9	128	14	7,221 21	56 41	1443 44	11 27
Ontario division, M. C. Worts, first assistant chief protector...	11	160	15	3,029 12	18 93	856 80	5 35
Southern Adirondack division, J. E. Leavitt, second assistant chief protector.....	8	126	16	2,596 70	20 60	197 97	1 57
St. Lawrence division, B. H. McCullom, fourth assistant chief protector.....	11	90	8	3,157 35	35 08	701 84	7 79
Central New York division, S. Hawn, fifth assistant chief protector.....	6	96	16	2,324 15	24 20	256 74	2 67
Western New York division, B. Salisbury, division chief protector.....	10	102	10	1,534 52	15 04	420 42	4 12
Eastern Adirondack division, R. B. Nichols, third assistant chief protector.....	9	91	10	2,182 63	23 98	262 16	2 89
Hudson division, W. Kidd, acting division chief protector.....	7	84	12	1,521 15	18 18	332 55	3 96
Northern New York division, I. Vosburgh, acting division chief protector.....	6	53	9	1,461 85	27 57	583 88	11 01
* James A. Colloton.....	.....	13	.....	1,059 59	81 54	542 01	41 69
Cases prosecuted direct from office.....	.....	3	.....	14,000 00	.....	.....	.....
Average recovery and cost per case.....	.....	.....	.....	.....	\$38 12	.....	\$5 45

* Not assigned to any division, reports direct to chief protector.

Record of Divisions Special Protectors and Others

DIVISION	Number of specials and others having cases	Number of cases	Gross recovery	Average recovery per case	Total costs	Average cost per case
St. Lawrence division, B. H. McCullom, fourth assistant chief protector.....	14	71	\$2,173 05	\$30 17	\$143 43	\$2 02
Central New York division, S. Hawn, fifth assistant chief protector.....	15	46	1,240 93	26 97	159 13	3 46
Southern Adirondack division, J. E. Leavitt, second assistant chief protector...	16	47	685 30	14 58	188 10	4 00
Hudson division, W. Kidd, acting division chief protector.....	14	28	489 00	17 46	102 75	3 67
Northern New York division, I. Vosburgh, acting division chief protector.....	1	4	97 50	24 38	4 50	1 15
Ontario division, M. C. Worts, first assistant chief protector.....	12	45	613 70	13 63	137 00	3 04
Western New York division, B. Salisbury, division chief protector.....	11	27	409 50	15 16	138 80	5 14
Metropolitan and Long Island division, E. A. Dorlon, acting division chief protector.....	9	26	382 95	14 72	50 60	1 94
Eastern Adirondack division, R. B. Nichols, third assistant chief protector.....	7	19	305 40	16 07	128 55	6 76
Southern division, L. Legge, division chief protector.....	5	10	153 75	15 38	2 75	28
Average recovery and cost per case..	.....	.....	.....	\$20 28	.....	\$3 27

FINANCIAL STATEMENT

STATEMENT OF EXPENDITURES FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1910

SUMMARY

Propagation and Distribution of Fish.

For Maintenance of Hatcheries and Collection and Distribution of Fish and Fry	\$58,281 37
For Repairs and Improvements to Hatcheries	1,780 67
For Miscellaneous Expenses, Fish Car, etc.	1,343 91
For Collecting Fish Eggs	2,909 29
For Shad Hatchery on the Hudson ...	376 15
For Fish Culturist—Salary and Ex- penses	3,894 28
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	\$68,585 67

Protection of Fish and Game.

For Salaries of Chief Protector, Assist- ant and Division Chiefs, Game Pro- tectors and Clerk	\$81,979 65
For Payment of Justices, Constables, Attorneys, Witnesses and Court Costs	20,830 61
For Maintenance and Expenses of State Launches	1,536 63
For Printing Game Laws	7,114 84
For Expenses of Chief Protectors and Protectors	42,061 25
For Extra Expenses of Protectors and Special Protectors	4,639 10
	<hr/>
	\$158,162 08

Forestry Account.

For Salaries and Expenses, Supt. Forests, Asst. Supt. Forests, Inspectors and Foresters	\$24,233 11	
For Surveying, Witness, Court and Attorney Costs defending State's title to Land	5,351 04	
For Rebates paid Towns for fighting Forest Fires and Salaries and Expenses of Fire Patrol, Telephone Lines and Observation Stations	87,291 64	
For Reforesting Burned and Denuded Lands in the Forest Preserve	24,027 36	
		\$140,903 15

Marine Fisheries Bureau.

For Salaries and Expenses of Superintendent, Deputy Superintendent, Engineer, Clerks and Fisheries Protectors	\$22,050 84	
For Office Rent, Postage, Stationery, etc.	3,532 01	
For Surveying, Plotting and Monumenting Shellfish Lands	718 51	
		26,301 36

Legal Department.

For Salaries of Attorneys and Employees	\$11,061 66	
For Office Rent and Expenses	1,940 39	
		13,002 05

Miscellaneous.

For Salaries and Expenses of Commissioners	\$11,722 33
For Salaries of Clerical Force	10,490 00
For Office Expenses	13,116 14
For John Brown Homestead Repairs..	290 24
For Lectures on Forestry subjects	1,887 39
For Game Bird Farm, Salaries and Expenses	11,755 50
For Catskill Map	366 75
For St. Lawrence Reservation	143 00
For Shellfish Commissioners' Convention	319 38

\$50,090 73

Forest Reserve.

For Land Purchased in Adirondack Park	\$1,411 00
For Land Purchased in Catskill Park	11,373 15
For Expenses of Inspection, Attorney Fees, Clerks and Costs	16,820 20

\$29,604 35

Hudson Highland.

For Hudson Highland Reservation	1,104 15
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Total Expended \$487,753 54





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